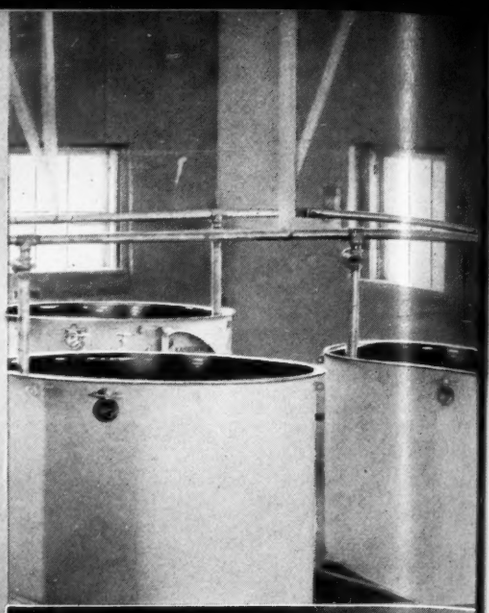
FOOD INDUSTRIES

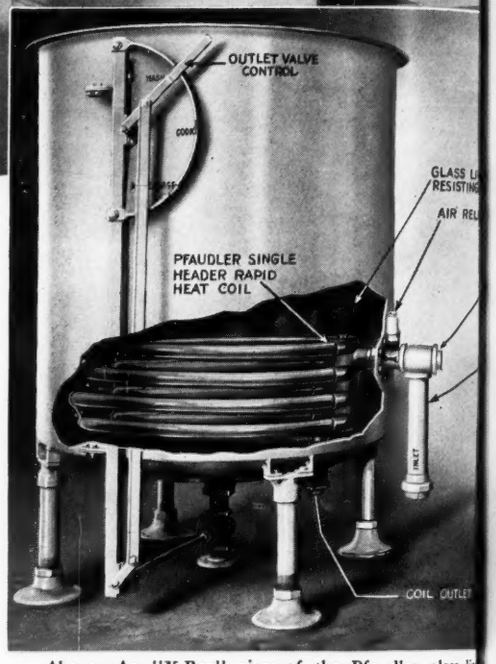
JUNE 1938

HOMES OF FAMOUS FOODS . . . CAMPBELL SOUP COMPANY, CHICAGO

IN THIS ISSUE: Quality Control for Frozen Foods; Applying Germicidal Ultraviolet

McGRAW-HILL PUBLISHING COMPANY, INC.





Above: An "X-Ray" view of the Pfaudler glass li
Tomato Products Cooker with single header "Rapi
coil and controls for accurate cooks. Self-draining bot
s:ruction eliminates product waste. For complete de
for Bulletin 759.

On your Mark

GET SET FOR THE TOMATO PACKING SEASON!

How Pfaudler cookers help you to win today's consumer at less cost

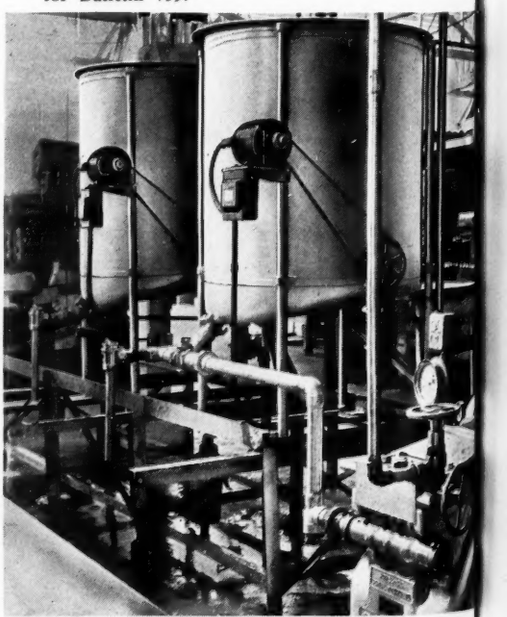
Ketchup looks like one of the bright spots in the tomato packing picture this season and a Pfaudler glass lined steel cooker is just what you need to put out better quality at less cost.

If you have never considered this cooker, keep these facts in mind—being glass lined, it's always easy to clean and keep clean. Moreover, glass is definite protection against flavor or color contamination since food acids cannot react with it. As for mechanical efficiency, Pfaudler's single header "Rapid Heat Coil" has proved as much as 50% faster in evaporating a given amount of pulp than other types . . . and burning-on has been virtually eliminated. There is no product waste either, since the tank is self-draining. Three standard sizes are available and prices are attractive enough to make this cooker a first-class investment.

If your requirements call for either tomato paste or tomato juice, Pfaudler vacuum pans and juice preheaters show you an equally good return. The hour is not too soon to do your ordering to be sure of delivery when you want it. Bulletin 759 gives you the story; send for it now. When writing, kindly state product to be handled and expected hourly production.

THE PFAUDLER CO., ROCHESTER, N. Y. *Main Office and Works*—Rochester, N. Y. *Branch Factories:* Elyria, Ohio; Schwetzingen, Baden, Germany; Leven, Fife, Scotland. *Branches:* New York, Boston, Chicago, Philadelphia; (Pfaudler Sales Co.), San Francisco and Los Angeles.

Pfaudler MEETS THE ACID TEST



Glass lined steel tanks are used in many ways for b
tomato juice—continuous preheating, deaerating under
as balance tanks before flash heaters or filling machi
for Bulletin 775.

PFAUDLER GLASS-LINED EQUIPMENT

M. A. WILLIAMSON
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★ *Homes of Famous Foods*

Campbell soups are among the most widely known of food products, and among a number of fine plants where these soups are produced is that at Chicago, Ill., shown on FOOD INDUSTRIES' cover this month. Picture by Metropolitan News Photos, Chicago.

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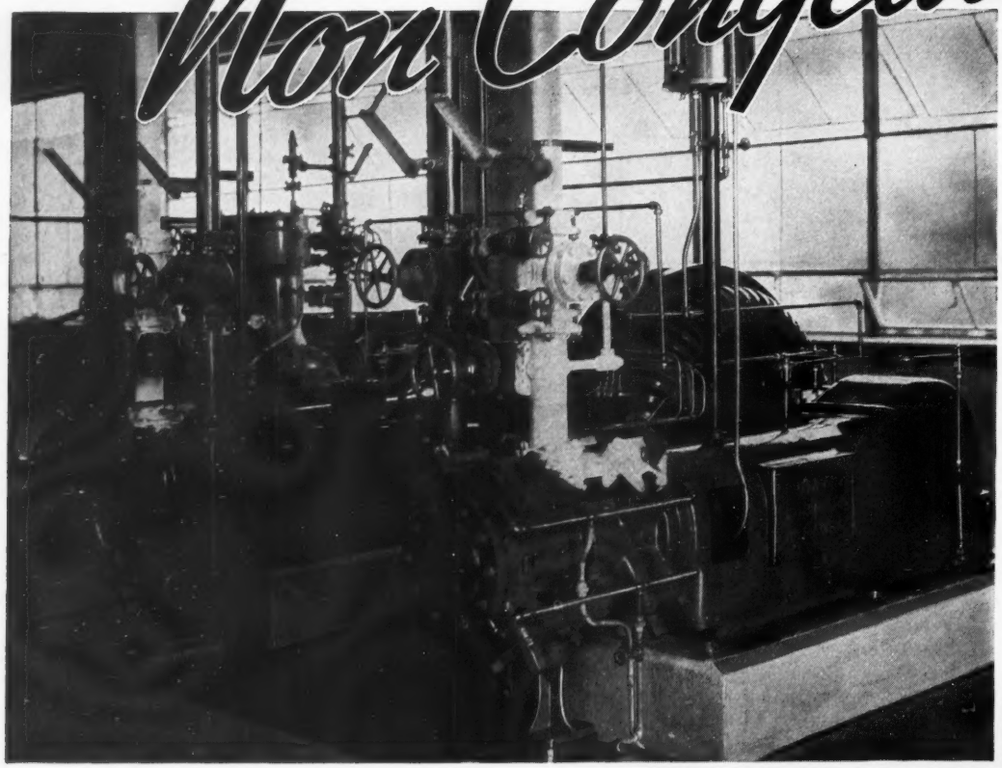
Non-Congealing!



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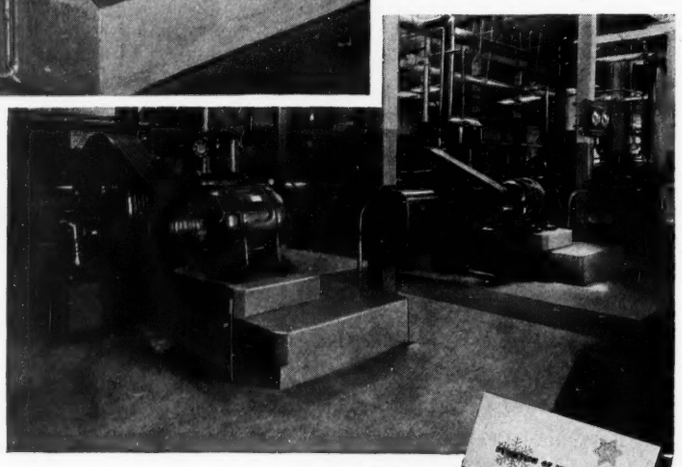
You spend less time cleaning, when the oil in your system separates quickly, completely from the refrigerant. Texaco Capella Oils do just this.



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FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol 10, No. 6

Laurence V. Burton, Editor

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JUNE 1938

The Talk of the Industry

» To CELEBRATE its twenty-fifth birthday the Department of Labor put out a sort of anniversary number of Labor Information Bulletin in February. It is very interesting, especially where it says that a working woman needs twenty pairs of silk hose per year.

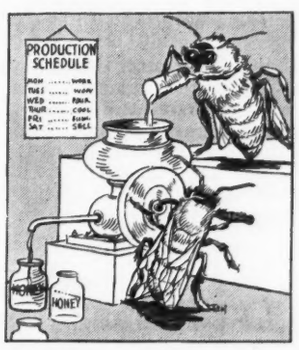
» WHATEVER DIFFERENCE exists between the "check off" (where the employer deducts the union member's dues from his wages) and the latest CIO method of making all the workers show a *paid up* membership card before they can enter a factory is more academic than real.

» LET IT NOT BE SAID that the good old Department of Agriculture is lacking in springboard qualities. Our old friend, Rexford G. Tugwell, who left his place as Undersecretary of Agriculture to become Vice-President of American Molasses Co., has recently become chairman of the Planning Commission of the City of New York. If Mayor La Guardia ever gets himself elected to the Presidency, we can expect to see ol' Doc Tugwell as Secretary of the Treasury.

» "FATALLY DEFECTIVE" was the term used by the U.S. Supreme Court to describe the administrative procedure used by the Bureau of Animal Industry of the U.S. Department of Agriculture, on a hearing of a complaint originating back in 1929. Though the Kansas City stockyards case is widely construed as a rebuke to Secretary Wallace, it could hardly be his fault if the "fatally defective" hearing took place three years before the present Secretary took office.

To those with a sense of justice and fair play, it should be construed as a rebuke to biased zealots in bureaucratic jobs, which might include Mr. Wallace. In throwing out the Secretary's order, the court did not test of the merits of the original complaint. The Court merely ruled that he who is haled before a quasi-judicial body has a right to have his side of the case presented before judgment is rendered. The rebuke to Mr. Wallace is entailed in his approval of five years of effort to enforce a ruling based on lopsided testimony.

» WE DON'T KNOW why we didn't think of it ourselves, but we didn't. And it always shrivels one's ego to have one's supposedly bright ideas improved upon. What are we talking about? Pardon us, we got the caboose ahead of the cowcatcher. In the Hors d'Oeuvres column of March issue we reported that Oklahoma prohibits any honey "which has not been homemade by bees, unless same is labeled 'imitation'." When this landed on the desk



of Editor M. S. Ireys of Armstrong Cork Co.'s *Modern Closures* it chased his nimble mind up two flights of imagination, and before he got everything under control he had created a striking cartoon of bees making honey on a mechanized production basis.

Note the bees' production schedule. They produce five days and sell on the sixth. Since bees never loaf, they probably use the seventh to sting competitors.

» BORDEN is not to be outdone by General Foods in certain little precautions that insure success. A year or so back when a new fishing trawler was christened and launched for General Foods, they took the precaution to scratch the ceremonial champagne bottle with a glass cutter so that the bottle would surely break at the psychological moment. For it is bad business if the bottle fails to spread its contents over a new ship as it slides down the ways.

Something of a parallel of foresight recently occurred on the New York World's Fair grounds, when the Borden Company broke ground for its Rotolactor exhibit. This will be in operation in 1939, with 200 cows stepping up and being milked while riding around the circle while a gaping world looks on in awe and wonder. When the ceremonies were at their height, President Ted Montague took a very dainty silver shovel and made a swift pass at the earth, then resumed his speech. His symbolic ground breaking had us greatly worried by its lack of a certain zeal that one associates with the initiation of a great enterprise. And then we chanced to peek behind a huge van that was parked nearby. Presto. There was the completed excavation, all done, even half full of water from a passing shower. Quick work, that.

» "THIS IS MIGHTY POOR BUTTER" said a tall, medium stout gentleman.

He was seated at a big table in the Hotel Carlton dining room, round which were four other prosperous-appearing men and five wives. They had all come down from Wisconsin, where the five men are prominent in the dairy industry, to see Washington's cherry blossoms.

"It's terrible," agreed the others, with no hesitation whatever. So the waiter was called and questioned. He produced an assistant manager, who confessed that the butter came from Argentina.

The party looked at each other blankly. No gavel was tapped, but the pleasure session was adjourned. A business session was opened. A lobbying crusade was in progress before the fingerbowls were passed.

Many things thereupon occurred. Some are clear. Others are obscured by the haze which always envelops such maneuvers.

It so happened that within two days, five of the Progressive members of the House, all from Wisconsin, suddenly deserted the New Deal and voted NOT to give the President the powers he wanted to shift and change government bureaus, to spend money before the expenditures are audited, etc.

The representatives concerned deny there is any connection between the two events, epoch-making as the latter was, for if the five had voted the other way, the President would now have those powers!

Over in the Senate, Mr. F. Ryan Duffy, who according to report is to be relegated to private life this fall by the La Follette machine when his senatorial term expires, tried desperately to win favor with the Wisconsin dairymen by banning the use of oleo in veterans' hospitals.

This annoyed the Southern conservatives, who never liked the Wisconsin point of view much anyway, and had wanted this market for the cotton growers.

More important, the whole dairy industry is getting worked up against the Cordell Hull reciprocal trade treaties. Which is intensely annoying to the State Department, for just recently, after years and years of bickering with Argentina over the beef embargo, due to the prevalence of the foot and mouth disease, that had been fixed up. Now comes something else again to promote bad feeling between the "Colossus of the North" and the most powerful of the Latin republics.

Velleity

VELLEITY is a rare word which is used in this issue. Even though we avoid all unusual words wherever possible there seems to be no other word in the English language which has its meaning. Velleity, according to the dictionary, is the lowest degree of desire—something only a shade above wishful thinking. As a matter of fact, it is used because an author insisted that only velleity could express his exact meaning. If you stumble over it, don't say you were not warned.

It Isn't Absence of Competition

THE PRESIDENT, in his anti-monopoly message, is still much concerned over that part of the income of the Simon-pure common man derived from common shares in corporations. He says that, in effect, it is as if one person in 300 received 78 cents of corporate dividends, while the other 299 persons divided up the other 22 cents between them.

Speaking as one of the 299, many of us could make one of those wisenheimers who gets the 78 cents look very amateurish if the corporation in which we own shares could pay any dividends at all.

The trouble is, not with the corporations which are able to pay dividends, but with those which cannot make enough to do more than keep going. According to the U.S. Treasury reports, about half the food corporations in the country showed no net profits in 1935. And it cannot be said that their problems are caused by "the disappearance of price competition."

For Sanitary Pipe Lines

A NEW SANITARY REQUIREMENT is about to come into existence in a certain large city, and there is considerable likelihood that other cities

Hors d'Oeuvres

• In the Weston-Levine vitamin chart is listed vitamin P P, which prevents pellagra. The foods richest in it are wheat germ, liver, peanut meal, and lean meat. Contrary to popular belief, it is not found in beer.

• *"A can-opener is not the badge of a lazy housewife. It is the extra hand of a busy woman. Scientific can-aided cooking is the cooking of tomorrow." That is not a quotation from ancient American history. It is the words of Miss Janet Bond, recently appointed head of the Canned Foods Advisory Bureau in Great Britain.*

• Scotland in 1433 passed a Parliamentary decree ruling that no one under the rank of baron should eat pie. And they didn't so much as say, "Let them eat cake."

• *Truffles, the most highly prized of edible fungi, grow 3 to 12 in. below the surface of the soil. They are located by their odor, which, however, is not evident to most human beings. Professional collectors of the truffle in France train dogs or pigs to locate the tubers by scent. If your hunting dog insists on locating game where there is none, maybe he's a truffle hound.*

• Laws recently adopted in Holland require butchers to pass examinations in bookkeeping, grammar, letter writing, economics, law and business methods. Must be copying Germany, where a former slaughterhouse executive is head of the country's most famous university.

• *The answer to how quick is the quick in quick-freezing has been provided by Dr. Alexander Goetz of the California Institute of Technology. He lowered the temperature of yeast cells from 45 deg. F. to —300 deg. at a rate of 300 deg. a second. And he restored the cells to life again by warming them at the rate of 300 deg. per second. Maybe you can have yourself preserved for prosperity by this system, but woe is you if the system goes haywire and you turn out to be a piece of tenderized meat.*

• Missouri meerschaums, of all things, are a byproduct of the food industries. The cobs come, of course, from corn, and. mouthpieces for the stems are shaped from the bones of cattle.

• *IN 1876 bananas wrapped in tinfoil were sold at a dime each at the Centennial Exhibition in Philadelphia. They were then a novelty.*

• At the Low Temperature Research Station in Cambridge, England, scientists are experimenting with radium, ultraviolet and X-rays in their hunt for an ideal system of sterilizing meat for cold storage. As a consumer, we'd like to see X-rays used, with a picture on every ham showing the size of the bone.

• *We never knew how really effective a letterhead could be as promotion piece until we saw the one used by Fruit Growers Cooperative, Sturgeon Bay, Wis. A wide band across the top of the letter pictures a solid mass of luscious red-ripe cherries in their natural color. And in the lower left-hand corner of the letter is shown a golden-crusted cherry pie with one piece cut out to show the juicy red fruit. Are we hungry!*

will follow this precedent. The name of the city is immaterial until the new regulation is officially promulgated, but the character of the impending regulation is all important.

The new regulation is going to require that all pipelines for handling food liquids in manufacturing plants shall be sanitary pipe lines. Heretofore, only dairies have been required to utilize this form of demountable piping. But with the results of careful scrutiny of piping for other liquids, one municipal health department has decided that a radical reform in all liquid food handling is needed. This new piping requirement is to be extended to include every food liquid—fruit juices, syrups, sauces, vegetable infusions, brines, beverages, brews, worts, melted shortenings, even water under certain prescribed conditions, and, of course, milk.

To rebel against these new requirements is to ignore the economic value of sanitation—perfect sanitation. Under the impending edict, not only must all food liquid piping be the easily demounted sanitary piping familiar to all dairies, it must be taken down and cleaned regularly. In many places the cleaning must take place every day.

Cases have been unearthed where syrup pipes have been nearly plugged up with an unpleasant goo that was teeming with living organisms and miscellaneous debris. This stuff sometimes sloughed off, probably ending up in some food product. Other cases have been discovered where pipes and pumps have never been disconnected for many years and, when ordered demounted by health inspectors, the condition found inside was a surprise and an abhorrence to all concerned.

Technical improvements such as the use of sanitary piping should come automatically and voluntarily as fast as improved equipment becomes available. But in one large area it is going to be required whether it is liked or not. Common sense tells us that a move of this character will spread all over the country. And common sense should also tell us that it is a good idea to plan for that eventuality right now.

Any new plans should be made with the sanitary pipeline definitely in mind. And all replacements should be made in conformity with the principle of utilizing demountable piping to be taken down and cleaned every day.

Wet Floors in Cold Rooms

SUMMER MONTHS give you a good opportunity to check up on losses of refrigeration through the opening and closing of cold room doors.

If you don't believe it, take notice of the difference in thickness of frost on the cooler parts and the degree of wetness of floors in rooms whose doors are opened and closed only once or twice a day compared to those through whose doors the employees pass frequently.

The difference is not hard to see, nor the reason for it hard to explain. Every time the cold room door is opened and closed, a flow of cooled air rushes out at floor level to be replaced by an upper layer of warm and moisture-laden air from outside. As warm air cools, its moisture vapor content freezes onto the coils or condenses as water droplets on the floor. In either case, extra power is needed to drive ammonia compressors, and the transfer of the cooling effect of the refrigerant on the inside of the coils is interfered with by the frost layer. Both of these results involve a wasteful increase in operating expense.

In addition to indicating this unnecessary direct expense, wetness of the cooler room floors may cause further unnecessary indirect expense. Often wet floors are slippery and may be the cause of accidents. Also they will impart their wetness to perishable articles stored in or close to the floors. And, too, it must be remembered that when moisture vapor is freezing on to the coils, or condensing on the floor, it will also be condensing on cold objects in the cooler whenever their temperature is below the dew-point. Such condensation on merchandise is often damaging to its quality.

If cooler-room doors must be opened and closed frequently, it will pay to have a vestibule space between the cold-room door and the plant area. The door into the vestibule should be fully closed before the cold-room door is opened if the loss of cold air and inflow of warm air is to be kept down to a minimum. Saving in refrigeration costs will easily pay for this vestibule in a relatively short time.

Kettle Safety

THAT FAMILIAR PIECE OF EQUIPMENT, the steam jacket kettle, has been bothering insurance companies for a number of years for the reason that up to now there has been no scientific way of predicting how strong is a given kettle. Insurance companies which carry liability insurance on kettles would like to know if the shape or design is right, if the metal is heavy enough and if the kettle walls are free from defects. They need to know all this if their insurance rates are to be fair and reasonable.

And every kettle user would like to be sure that his equipment is absolutely safe, also that he is not paying for more metal than he needs, nor insurance rates that are unnecessarily high. Unfortunately, there are a few sharp buyers in this wicked world who care more for a good bargain than for safety. But until an acceptable theory of design is available the only safe way to buy is to take the best that the kettle maker can produce—never the weakest that his conscience will permit him to sell.

FOOD INDUSTRIES has learned, via the grapevine, that the long hoped for design theory is soon to be presented to the proper engineering societies and presumably will become a factor in purchasing. Such a desirable achievement, plus the new German X-Ray technique for studying kettle walls for thickness or defects (Engelhardt: *Wochenschrift Brauerei*, 54, 231 (1937) ought to eliminate all uncertainties from hollow pressure vessels as far as safety is concerned.

But there still remains the question of performance. A kettle is a piece of production equipment which must have a speed and capacity suitable for the function it plays in a production line. And no matter how safe the kettle may be it must perform satisfactorily as an integral unit in the plant. Which puts the question right back into the production manager's lap for definite performance specifications.

Non-Food Byproducts

RESEARCH to cost four million dollars per year will soon start in the Department of Agriculture to determine new uses for surplus crops. With the exception of cotton, the crops are food raw materials. The food industries are, therefore, tremendously affected by this new development. They will gladly cooperate.

Although not so expressed in the Farm Relief Bill which established these laboratories, the purpose of Congress is to secure new non-food products from agricultural materials. This should also be an important object of industrial research by the food industries.

Complete utilization of the agricultural materials which we buy has long been recognized as a necessary measure for low-cost manufacture of the major foods which we sell. It is a fine thing to see a well financed program of the government supporting this idea. It is to be hoped that the methods used will be fundamental, not merely superficial. Then the food industries can promptly adopt the scientific results from the government laboratories, and put them to work for the benefit of both agricultural sellers and food buyers.

Developing MEN and METHODS for the Food Industry

Dehydration laboratory and model recirculation dryer in food products industries building.

Career men are trained at Oregon State by a four-year course in food technology. There is also a short course. And research is done on commercial problems.

By ERNEST H. WIEGAND

Head of Food Products Industries Department, Oregon State College, Corvallis, Ore.

ERNEST H. WIEGAND

The instruction and research in food technology at Oregon State are carried out under his direction. He founded the food technology work and has been its head since, except for brief leaves of absence to work in the commercial field.

PERHAPS the food industries are to blame. Or maybe the responsibility lies with the colleges and universities. But few of the schools of higher education have made any attempt to produce technically trained man-power to direct the destinies of the food manufacturing and processing industry—an industry with 48,680 establishments which supply products valued at $9,510,674,624 to 862,000 retail outlets and 128,000,000 consumers.[1]

An exception among the schools is Oregon State College, Corvallis, which has been conducting a course in food technology for nineteen years. And not only is this college graduating students from a four-year course which prepares them specifically for successful careers in the food field, but it is giving advanced training to technologists already in the industry and is contributing to the knowledge of food processing by research work on practical problems.

Men who enroll at Oregon State to prepare themselves for service in the food industries and acquire the degree of bachelor of science in this field, are given thirteen special courses in food technology, these in addition to many related courses in chemistry, bacteriology and other branches of horticultural and general agricultural instruction. These courses include:

Principles of Food Preservation.—Fundamental principles involved in freezing, drying, concentrating, smoking, salting, fermenting, carbonating and the use of heat, electricty and chemical preservatives for the preservation of all types of foods.

Principles of Canning Fruits.—Fundamental principles of canning fruits: varieties, buying, handling before canning, grading, methods of preparation, blanching, syruping, water and steam exhausting, sealing, cooking, cooling, storage, causes of spoilage, judging of canned foods, types of containers, marketing practices and working knowledge of methods used in commercial, farm and home canning.

Principles of Canning Vegetables.—Continuation of "Principles of Canning Fruits," with applications to vegetable canning and vegetable products. Retort installation, operation and control, handling methods, heat penetration, time of cooking and thermal death points. Vegetables are canned by different methods and results compared. Commercial plants are visited for study.

Canning of Fish and Fish Products.—The fundamental principles of canning, heat penetration, thermal death points, the effect of acidity, vacuum, can fill, grading, seaming, cooking, storage corrosion; canning of fish, clams, oysters, shrimp, etc.

The Canning Plant and Its Equipment.—Study of the economic phases of the canning plant, its location, general plan of construction, equipment and operation. Training in designing plants and estimating costs. Laboratory work covers the construction, installation, operation and adjustment of canning machinery. Field trips to canneries to study their construction.

Food Products.—Commercial methods followed in the manufacture of such foodstuffs as fruit and vegetable byproducts, spices, condiments, flavoring extracts, syrups, leavening agents, animal foods; the use of sugars, vegetable cooking oils, flours, and cereals.

Dehydration of Fruits and Vegetables.—Actual drying of fruits and

[1] From 1935 Census of Manufactures.

vegetables is done. The study covers all of the common types of driers and principles of dehydration. Methods of testing for moisture and adulteration are stressed.

Pickles, Relishes and Condiments.—Theory, principles, and practice in vinegar and salt pickling. Making and packing of sour, sweet, and dill cucumber pickles; pickling of other products such as onions, melon rinds, carrots, beets, crab apples, tomatoes; tomato products, salad dressings, relishes, and sauerkraut studied and manufactured. Causes of spoilage and testing methods are emphasized.

Fruit Juice and Vinegar Manufacture.—Practical and scientific work in the handling of fruit juices; problems of filtration, sterilization and bottling.

Commercial Jam and Jelly Manufacture.—Principles of making jams and jellies from fresh and frozen fruits, correlated with laboratory practice and quantity manufacture; testing for yields, moisture content, pectin requirement, acidity, sugar, etc., stressed.

Preserves, Glacéd Fruits and Candied Fruits.—Manufacture of preserves, marmalades, conserves, maraschino cherries, glacéd fruits, and candied fruits.

Food Products Manufacture.—Physical, chemical and bacteriological principles involved in the preparation, preservation and examination of fruit, vegetable, and food products.

Frozen Foods.—Studies of the physical, chemical, bacteriological and enzymatic changes occurring in products before, during and after freezing; processing methods, storage, transportation and distribution of frozen foods.

With one exception, all of these courses include laboratory work.

In addition to assimilating technical knowledge from the special courses, the students profit by working with college staff members who divide their time between instruction and research projects. So they are fitted for positions in industry. Graduates are now serving as food technologists with such companies as California Packing Corp., American Can Co., Continental Can Co. and many smaller firms. One graduate heads up a food laboratory in British Columbia. Some of the graduates are located in far away places, including China, India, South Africa, South America, Canada and Hawaii.

The short course, which gives superintendents, managers and staff men of commercial canneries an opportunity to brush up on the latest scientific developments in the field of food preservation, was started sixteen years ago. About 130 men attend this each year, some coming back year after year.

Research on commercial problems in food technology represents one of the most practical phases of the work done by the food industries division of Oregon State College. Projects currently underway include studies in the utilization of corn sugar, standardization of jelly making processes and problems in connection with the rapidly expanding frozen foods industry and the manufacture of fruit juices and fruit-juice concentrates.

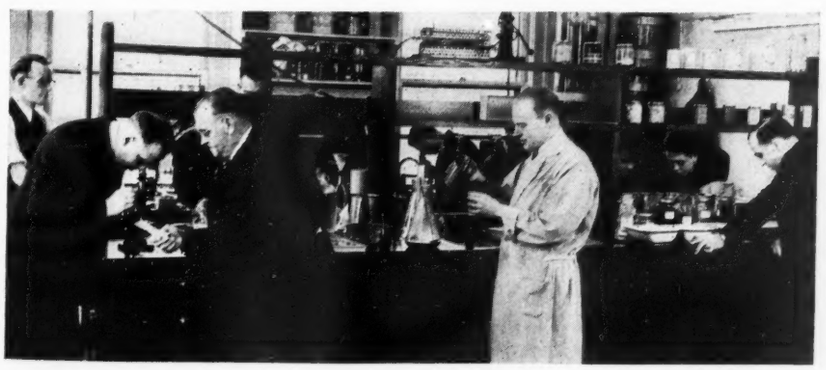
Extensive tests on different varieties of fruits and vegetables suitable for freezing are being carried on in cooperation with the U.S. Bureau of Chemistry and Soils. Cooperative experiments are being conducted in both fruit and vegetable processing in connection with plants of the North Pacific Canners and Packers, a federation of cooperative food processing plants.

Many outstanding practical accomplishments have resulted from research at the college in past years. A recirculation drier was developed which more than doubled the capacity of prune-drying plants and at the same time improved the quality, saved time and labor, and cut fuel consumption. Savings effected amount to approximately a half million dollars a year. Improvement was also made in apple drying. And methods of grading and separating prunes for drying were worked out. A long-exhaust process was developed for canneries, this improving the keeping quality of the products. This process has found wide commercial application.

Another problem solved for the canning industry had to do with sulphur spray residues on fruit for canning. It was determined that trouble caused during the canning process by these residues would be eliminated if the spray was applied as wettable sulphur, or some other form not in combination with lime. Other research work resulted in an improved container for dried prunes, the development of a prune-juice byproduct with a promising future as a beverage, and the development of the first commercial method of processing maraschino cherries. The latter, perfected some years ago, has been so generally adopted that practically the entire domestic tonnage is processed by that method.

The work of the food industries division of Oregon State College is centered in a separate, specially constructed building. This building houses a small canning plant, a dehydrating unit and preserving equipment, both on a laboratory and commercial scale. A fair tonnage of products is put through these laboratory plants annually, using a combination of experimental and commercial methods. In this way is provided practical training under conditions comparable to those which will be encountered in the commercial field. At the same time, research is carried out on a scale which gives real value to the findings made.

The food industries laboratory has proved an invaluable adjunct to the fruit breeding work of the state and federal horticulturists. As fast as new varieties show promise, they are tested for their canning, preserving or freezing qualities.



Cannery managers and superintendents working in one of the laboratories during the annual short course.

Text and Reference Books

BITTING—Appertizing or the Art of Canning.
BROOKS—Critical Studies in the Legal Chemistry of Foods.
CAMPBELL—Campbell's Book—Canning, Preserving & Pickling.
CHENOWETH—Food Preservation.
CHENOWETH—How to Make Candy.
COBB—Canning of Fishery Products.
CRUESS—Commercial Fruit and Vegetable Products.
ELLIS & McCLEOD—Vital Factors of Foods.
GIBBS—Spices and How to Know Them.
GORTNER—Outlines of Biochemistry.
HERSTEIN-GREGORY—Wines & Liquors.
HIER—The Manufacture of Tomato Products.
HIRSH—Manufacture of Whisky, Brandy & Cordials.
JENSEN—Chocolate Confectionery and Cocoa.
MORRIS—Principles of Fruit Preservation.
ROOKER—Fruit Pectin.
TANNER—The Microbiology of Foods.
TRESSLER—Marine Products of Commerce.
TRESSLER & EVERS—The Freezing Preservation of Fruits, Fruit Juices & Vegetables.
THE CANNING TRADE—A Complete Course in Canning.
THE CANNING TRADE—A History of the Canning Industry.
VULTE & VANDERBILT—Food Industries.
WALTER—Essence Industry.
WEBSTER & ALSBERG—The American Vegetable Shortening Industry.
WESTERN CANNER & PACKER—Yearbook.
WINTON—Structure & Composition of Foods.
WOODMAN—Food Analysis.

Why Not Make CAPITAL Out of OUR TAX FIGURES?

By L. V. BURTON
Editor of FOOD INDUSTRIES

AN IMPORTANT CHARACTERISTIC of the 1937 annual reports of nearly all corporations irrespective of their line of manufactures is their emphasis on taxation. Some concerns have even gone so far as to send a special letter to stockholders to explain the situation further. One such company has projected the tax picture for the coming year insofar as there is any certainty about the rates, as is possible in the case of Social Security taxes. What appears to be the ideal of all such special letters, however, is the report to jobholders—not stockholders—made by Johns-Manville, Inc. This report, more than any other which has come to light, lets the employee know in terms which he can understand just what is his part in the corporate affairs.

After reading a great many reports and asking further questions of management, one is struck with the seeming reluctance of many concerns to speak frankly and openly about their tax problems, especially Social Security tax matters. A few concerns like Continental Baking Corporation and National Dairy Products Corporation discuss the matter in their annual reports. Many other companies are perfectly willing to tell the inquirer about the facts on condition that their name be withheld from any public discussion.

As a result of this reluctance, and the great difference in methods of reporting the figures, it is impossible to draw many important conclusions from the current situation. One point stands out clearly, however. Total taxes paid by corporations, exclusive of income taxes, when figured out on a per share basis often give figures that come astonishingly close to reported net earnings per share. And, of course, dividends per share come still closer.

In three instances it has been possible to compare dividends paid with Social Security taxes. One concern paid $0.50 per share in dividends and $0.34 per share in Social Security taxes. Another company paid dividends of $8,082 in 1936 and 1937 while at the same time it paid Social Security taxes of $8,762. Still another concern paid dividends of $1.15 per share and Social Security taxes of $0.48 per share.

The purpose of this discussion is not to debate the wisdom or righteousness of the various forms of Social Security taxes but to call attention to two important aspects of their existence. In theory, at least, the SS taxes are supposed to accrue to the benefit of the employee. Government is the custodian of the funds, but persumably they are for the employee and are to be paid back to him under suitable prescribed conditions. The SS taxes, then, actually represent a form of corporate profit-sharing with the employee, even though the government seems to believe that government is a better custodian than the individual—a matter of debatable opinion.

A new significance attaches to SS taxes when it is recalled that Mr. John L. Lewis, of C.I.O. fame, told this writer last year that one of his goals is a condition where the employee shares the profits equally with the stockholder. In two of the foregoing instances it is apparent that the goal has been nearly reached. And in view of Mr. Lewis' growing importance in the political field it appears likely that his philosophy may become a political reality in a very few years.

Accordingly, it seems to be a matter of increasing importance that adequate publicity be given to the taxes paid, especially Social Security taxes. In these figures is to be found the seed for a favorable public relations campaign—at least an industrial relations activity. In such figures as are available the amount paid in 1937 runs from $45 to $57 per employee. In another year they will be considerably higher—nearly 50 per cent—because of the step up in rates, as required by law. Which is a lot more than most stockholders receive unless they each own more than twenty shares of food company stocks.

In view of the growing social and political importance of the C.I.O. and the whole social movement of the day, it is not one minute too soon to begin to educate both the public and the employee about the finances of his business. Not only is it important to harp on the growing burden of taxation, and the profit-sharing implications of Social Security taxes, but also it is important to educate the rank and file of employees on how much it costs to put a man to work.

Several years ago, a large meat packing company figured it required $6,000 of invested capital to put one man on the payroll. A dairy company has fixed assets (on a depreciated basis) of $3,451 per employee. Johns-Manville's admirable report to Job Holders frankly tells them it has $4,561 invested per employee. Other comparable figures for depreciated fixed assets per employee in food companies are: $2,820; $2,396; and $713 for a chain grocery with a large manufacturing department. These figures of course, do not represent replacement values. And they omit the very important—nay indispensable—working capital which is just as important as buildings and equipment.

Executive salaries lumped together and computed to an amount per employee per day can be "sold" to employees on the basis that this amount is their insurance that their jobs will continue. In one company the employees agreed that 3 cents per day per man was a reasonable job insurance.

The trend of the times is toward employee participation in profits and, perhaps, ultimately in management. It is the part of wisdom to tell them *all* the facts.

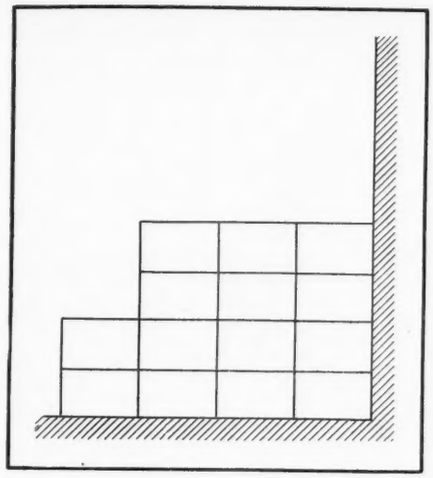


Fig. 1—Never pile packages of frozen foods in the cold storage room in this manner. For correct method see Fig. 2.

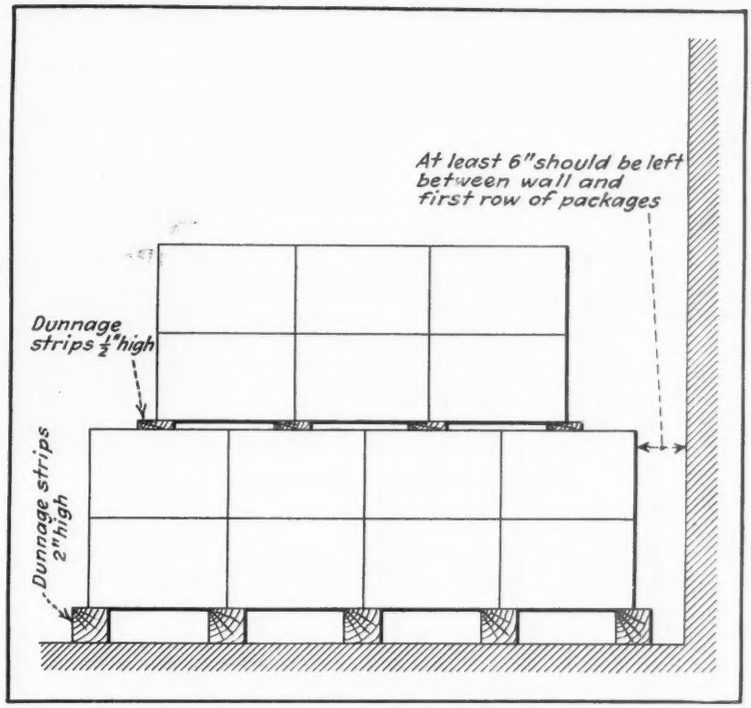


Fig. 2—At least 2 in. of space should be left between the floor and bottom row of packages, and 6 in. between packages and wall. Also, it is necessary to separate every other layer of packages by at least ½ in. Only in this way can proper circulation of cold air be maintained, so that frozen foods in storage will keep in proper condition.

Precautions Necessary When STORING FROZEN FOODS

By JOHN J. ANTUN
Merchants Refrigerating Co., New York, N. Y.

DISTRIBUTORS OF FROZEN FOODS are cropping up in some of the smaller cities not now equipped with cold storage facilities. They will be obliged to build a small holding room, sufficiently large to hold a week's or two weeks' supply.

It is very important that a room for this purpose have at least 6 in. of good insulation on all four sides, top and bottom. This room should be placed as close to the loading platform as possible to insure a rapid transfer of merchandise. The height of the room from the floor to the ceiling should be between 10 and 11 ft., thus avoiding loss of space above the piles.

In our past experience we have employed the following methods: Frozen foods must be kept at 0 deg. F., or as near as possible to that temperature at all times. This should be kept in mind when handling goods outside of freezer room. The quickest method should be employed whenever warehouse employees handle frozen products from and to cars or trucks and from and to freezer rooms. In loading and unloading from refrigerator cars or trucks, no more products should be removed from carrier at one time than can be quickly put into a freezer room.

One of the first considerations for successful storage of frozen products is air circulation. Packages should never be piled directly on the floor of the storage room, as in Fig. 1. Strips of wood, commonly known as dunnage, should be laid on the floor so that the first layer of cases is about 2 in. above the floor, as shown in Fig. 2. Piling should start from the wall toward the center of the room, starting at least 6 in. from the wall. Between every other layer of cases, place dunnage not less than ½ in. thick and not more than 4 in. wide. All dunnage must extend at least ½ in. past the end of the package. Otherwise, the cases will crush down over the ends and thus reduce the space between cases. This condition will not permit proper circulation.

In building up piles from the wall to the center of the room, ample aisle space should be allowed, with aisles running parallel with the overhead coils and main aisles, preferably under the center ceiling coils. Cases should never be piled higher than 1 ft. below the ceiling or 6 in. below the bottom of ceiling coils.

When defrosting coils by scraping, a tarpaulin should be placed over piles of cases and directly under coils to prevent the frost and ice from falling on the cases.

An outside refrigerator door, with inside swinging doors, is advised to avoid loss of cold air when making deliveries.

When storing your frozen foods, select your warehouse as you would your bank.

By DONALD K. TRESSLER
Head, Chemistry Division
N. Y. State Agricultural Experiment Station
Geneva, N. Y.
and formerly Chief Chemist, Birdseye Laboratories

QUALITY CONTROL

Vital to Success In Frozen Foods Industry

FOR MANY YEARS frozen foods had a bad name. The stigma was that many laws had been enacted to prevent retailers from selling thawed foods as fresh ones. In many states those selling frozen foods had to post a sign reading *Cold Storage Goods Sold Here* where each customer would be sure to see it.

The reason for this is not hard to find: *Little consideration was given either to the quality of the food being frozen or to the methods employed in freezing, storing and handling it.* Foods known to be of poor quality were often frozen and held a little below freezing until times of scarcity and then thawed and marketed. Often thawed fish remaining unsold Friday night were again put in freezing storage. Later these fish were again thawed and then offered for sale a second time. Such products were obviously unfit for food and consumers learned to be skeptical of the quality of cold storage foods of all kinds.

About 1923 certain responsible fishery companies began to be very careful of the quality of the fish selected for freezing and to employ quick freezing methods which were known to retain fresh qualities in frozen products. It was soon found that quick freezing alone was not enough to preserve freshness; low storage temperatures were also necessary or the frozen products soon lost their freshness and became "salt fishy" in flavor. Even when high quality quick frozen fish were offered, they were not always readily accepted by the trade, so a large proportion of the product was thawed and sold simply as "fish" and not as quick frozen fish.

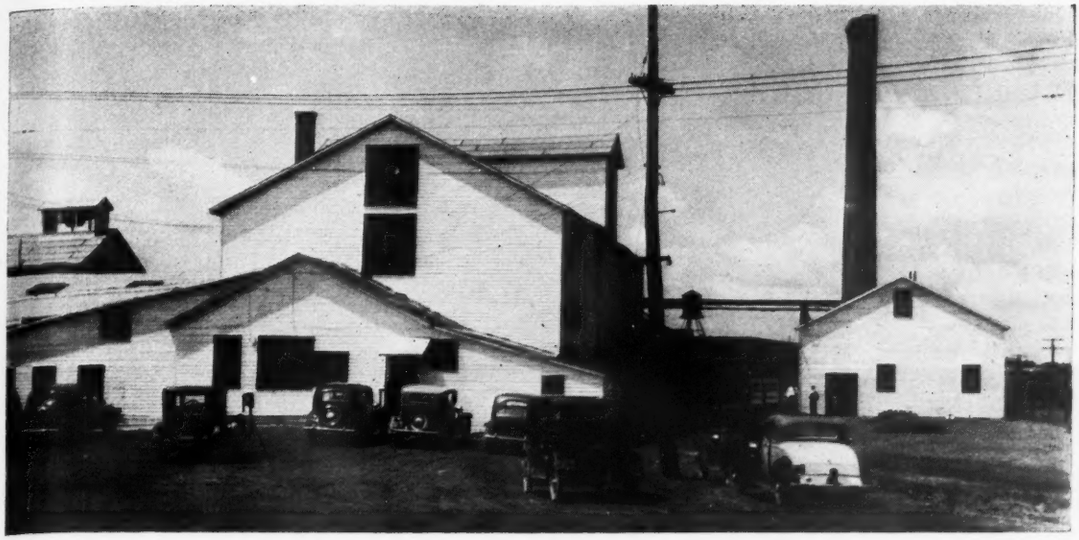
Since thawed foods deteriorate much more rapidly than frozen foods, it was evident that another important step still remained before the very finest quality of quick frozen foods could be delivered to the housewife. This step, in many ways the most important and revolutionary of all, is that of holding the product in the retail store at a temperature of 10 deg. F. or lower until it is actually sold to the customer. Even today large quantities of the frozen foods sold to the housewife are not so good as they otherwise would be, since they are thawed before being displayed or sold. A great quantity of frozen poultry, fish and shellfish is handled in this way.

In 1929 and 1930, Clarence Birdseye and his associates demonstrated clearly that if proper care was taken in the selection, handling, preparation, freezing and storage, frozen fish, shellfish, meat, poultry, fruits and vegetables of a quality comparable to an excellent grade of fresh products could not only be produced but, what is more important, could be marketed at retail. The excellence of the Birdseye system depends not only on the method of freezing employed, but also on the application of years of research on the selection, handling and preparation of the products.

At first the public was slow to accept quick frozen foods even though they were found to be of high quality. The very novelty of the idea and the fact that previously frozen products had always been regarded as inferior products slowed up their acceptance by housewives. Another

▶ ***Success in the frozen foods business depends upon placing in the consumer's hands a product of high quality—one equal to or better than the average quality of first-class fresh foods. This can only be accomplished by means of adequate control—control which starts with the selection of the variety that is to be frozen and extends through all the steps of raw material production, preparation, freezing, storage, transportation, wholesaling and retailing. How this control can be established and carried out is told in this article, for the benefit of freezers of***

Fish **Fruit**
Meat **Poultry**
Vegetables



Typical canning plant in which quick freezing of peas has been taken on as an added function.

almost insurmountable obstacle was the depression which made dealers very reluctant to invest money in cases to hold novel products which might not sell. Eventually the depression receded and production of frosted foods moved rapidly ahead. A few other companies entered the quick frozen fruit and vegetable field. Most of these moved cautiously ahead taking due care in the selection of raw material and in the handling and processing of the products. Those that were careless, or lacked information concerning methods, soon stopped packing or were forced to quit because of the lack of demand for products of mediocre quality.

In the last two years the fine quality of quick frozen foods has been appreciated by the public and the sales of frozen fruits and vegetables have increased very rapidly, just as had been anticipated. Because of the rapid rate at which certain companies are moving ahead, the frozen food business appears to be a very lucrative one, and so today (as shown in the April issue of FOOD INDUSTRIES) approximately a hundred new companies are entering the frozen food field; many of them are to freeze fruits and vegetables.

A number of the companies going into the frozen food business have had no experience in refrigeration and have conducted very little experimental work on frozen foods. These companies are riding for a fall. Merely because a food was frozen quickly is no sign that it will be of good quality nor that it can be sold in a market where quality is a first consideration. Quick freezing is not all there is to it. If you don't believe the writer, ask any of the officials of The Borden Co. or of National Dairy Products Co. These companies lost considerable sums in the frozen orange juice business in 1931 even though they had the benefit of large technical staffs. How far will some of the companies, having neither trained technical staffs nor financial resources to stand losses, get in the frozen food field? You may answer that it is simpler to freeze fruits and vegetables than to freeze juices and further that a large market now exists for the former products.

It is true that a large market exists for frozen fruits and vegetables of high quality. But it is also true that it is just as difficult to produce a high quality of frozen peas or strawberries as it is to obtain excellent frozen orange juice.

A very great danger lies before the frozen foods industry; a danger that a considerable proportion of the frozen foods packed in the next year or two will be of mediocre quality. If this occurs, the business will slump badly, and a large number of those now entering the business will be ruined. You may answer, "Oh, but you forget that this will not affect my business, because my product is sold only in branded packages and my brand is known as a quality product." The average housewife may buy by brand, but she is easily scared by reports concerning frozen foods which "taste queer." If a few stories get into the newspapers or on the radio about persons made ill by frozen shellfish, vegetables or other products, sales of frozen products will slump overnight. Further, if quick frozen or frosted foods as a whole get the reputation of being

Each leaf of spinach must be individually inspected before freezing if the quality of frozen spinach is to be right.

inferior to fresh foods, immeasurable harm will have been done, and the industry will have received a setback from which it will take years to recover.

Anyone entering the frosted foods industry must remember that he will have to compete with fresh foods. If his frozen vegetables are not substantially as good as the average fresh vegetables, he will soon fail. With a few possible exceptions, freezing does not improve the quality of a food. It must be admitted that frozen products very slowly lose their freshness during storage. How then is the packer to obtain frozen products equal to or superior to the average fresh foods? The answer is by very carefully selecting and grading his new material, and then making certain that it is handled, processed, frozen, stored and marketed under optimum conditions. The only possible way to do this is to obtain accurate and reliable information concerning the proper procedures which should be followed in selecting, processing and freezing the foods and then install a *quality control system* which works and thus insures the quality of the product.

Beware of relying on information supplied by the company promoting any given quick freezing system. Remember that, for the most part, promoters are salesmen and not food experts. Often they make false representations, either through ignorance or mere anxiety to make sales, and make absurd claims concerning the equipment and process they offer. Before signing on the dotted line, insist on visiting a commercial plant using that particular process for freezing the products you expect to freeze. Merely because a process is used successfully for freezing poultry is no sign that it may be employed with equal success on spinach. Not long ago a man promoting a new quick freezing process stated that his process produced excellent frozen corn on the cob even though the corn was not scalded (blanched). What he failed to say was that such corn would be worthless after a month or two in storage!

If you are considering the licensing of a patented process, look into the value of the patent itself. Perhaps the same effect may be produced in a simpler manner without infringing the patent in question.

'Tis said, "The road to Hell is paved with good intentions." It is equally true that the road to business failures is paved in the same way. Every packer *intends* that his frosted product shall be of excellent quality, but few make certain that this will be the case. To be effective, quality control must be divorced from production. In other words, quality control should be responsible to the general manager or executive vice-president and not to the production department. Why? Well, too often the factory superintendent thinks principally of production rates, yields, and costs. In order to pack the required number of cases a day at a given cost, he is likely to allow the urgency of the case to influence his judgment and pass a product as first grade that should be rated second grade. If the quality control laboratory is under the factory superintendent or production manager, the production man may overrule the inspector and thus impartial quality rating is unlikely. Further, the quality control laboratory should be in constant intercourse with the research laboratory so that production problems may get the prompt attention of the research worker, and, conversely, the control laboratory will immediately get the benefit of any worth-while innovations suggested by the research workers.

Unloading pea vines at the viner station prior to quick freezing operations

Quality Control In The Vegetable Industry

In a short article such as this it is obviously impossible to indicate just how a quality control laboratory should operate in each frozen food industry, therefore only one industry will be considered in detail. Since the frosted vegetable industry is one of the youngest of the frozen foods industries, and since greater danger may lurk in this industry than in some others which are better established, and further since so many canners and others with no freezing experience are entering this industry, it will be given the principal consideration.

Quality control in the frosted vegetable industry should begin with a consideration of the kinds of vegetables which should be grown to supply a given freezing plant. Thus sweet corn and peas grown in western New York are of excellent quality, whereas this location is not well suited for large scale production of Lima beans. On the other hand Lima beans of fine quality are grown on the Eastern Shore of Maryland, but the peas grown there are not particularly well suited for freezing. The type of soil on which the vegetables are to be grown should also be considered by the control laboratory. For example, spinach grown on certain types of upland soil freezes well, but when grown on other upland soils this vegetable does not have good texture. Some muck soils produce good spinach, others do not.

Long before the packing season starts, the package in which the vegetable is to be placed should be very carefully tested in the quality control laboratory for moisture vapor-proofness and other qualities. A consideration of some of the more important packaging problems was given in the February, 1938, issue of *Modern Packaging*.

The choice of the varieties of each vegetable to be grown is an even more perplexing problem than the selection of vegetables. Of course the varieties demanded by the trade must be grown; thus yellow corn must be grown if the frozen product is to be sold in New York or New England, but care must be taken to select a variety or cross which will not only grow well in the region in which the freezing plant is located but will also yield a frozen product of high quality. If corn on the cob is to be packed, variety should be considered very

carefully indeed, for only a few varieties freeze well. Vegetables which make desirable canned products do not necessarily yield high quality frozen products and vice versa. Thus the standard canning varieties of peas, Perfection and Surprise, should not be selected for freezing.

Perhaps the most important job of quality control in a vegetable freezing plant is to make certain that the vegetables are harvested at optimum maturity. Starchy peas yield an almost inedible frozen product. On the other hand, immature peas are lacking in flavor and will not suit the restaurant and hotel trade because they collapse badly on the steam table. If the maturity of sweet corn selected for corn on the cob is not just right, the product will be very difficult to sell and the pack will be a failure. Woody asparagus or snap beans with fiber in the side walls simply cannot be used or the products will be inferior, if not entirely worthless.

In canning, processing tenders the vegetable and so relatively mature vegetables may be used. This is not the case with vegetables which are to be frozen. The maturity must be just right or the product is definitely inferior.

Vegetables must be carefully inspected to make certain that all insect infested material is rejected or eliminated. Peas may contain weevils. These insects are so small that unless the peas are carefully examined, insect infested material may be accepted for packing. Aphids in broccoli are often very troublesome.

Vegetables are also subject to diseases. "Rusty" beans are common in certain seasons. Inspectors must be constantly on the alert in order to make certain that vegetables affected by disease are rejected.

Those responsible for the quality of the products must not only make certain that the proper procedure is followed in threshing, cleaning, washing, blanching, cooling, grading, and inspecting the vegetable as it passes through the packing plant, but also that the equipment is operating properly at all times. Further, there must be no delays at any time or vegetables will quickly lose their quality. During hot weather especial care must be taken to handle the products at the maximum possible speed. Sweet corn begins to lose quality the moment it is picked. Its goodness is not stabilized until it has reached 0 deg. F., and then only if it has been properly blanched. Sweet corn allowed to remain in piles or sacks overnight in warm weather may lose half its sugar content. Vined peas and Lima beans deteriorate exceedingly rapidly if allowed to stand in a warm place.

Water used in washing should not only be fairly soft, but it must be free from pollution. As a rule, pond water is unsuitable for use on food products. The washing procedure must not only be adequate to remove all dirt and insects, and this in the case of vegetables such as spinach and broccoli is by no means easy, but it must also eliminate any spray residues which may contaminate the vegetables.

Scalding or blanching must be adequate but not so severe that a considerable proportion of the vitamin C content of the vegetable is leached out or destroyed. Samples of the product should be tested at least twice daily to see if the blanching treatment has eliminated all traces of enzymes. Either the catalase[1] or peroxidase test should be used. Because of the great variation in the size of the ears of corn and the stalks of asparagus, these two vegetables are more likely to be improperly blanched than others.

Adequate and rapid cooling is also of great importance. In warm weather bacteria multiply rapidly in improperly cooled vegetables, and they may sour before they can be frozen even if a quick freezing process is used. Slow cooling causes a tremendous loss of vitamin C. One packer doubled the vitamin C content of his frosted spinach by merely increasing the amount of water used in cooling his spinach.

IF a brine flotation system of quality grading peas, Lima beans or whole grain corn is used, it must be watched almost constantly in order to be sure that brine of the proper specific gravity is employed. The quality control laboratory should set up maturity standards and make certain that the quality grader is operated in such a way that this quality is maintained. In FOOD INDUSTRIES, January, February and March, 1938, some of the problems connected with the quality grading of peas were presented. From this consideration it is easy to see that rule of thumb procedures cannot satisfactorily be used in operating a quality grader.

The final inspection of the prepared vegetable, which is usually conducted as the product is passing over a belt, must be thorough so as to eliminate any foreign matter and defective vegetables that have accidentally passed through other operations.

The filled packages should be checked from time to time to see if they are properly closed and sealed and contain the proper weight of product.

Prompt freezing is just as important as quick freezing. The author has observed operations in which otherwise excellent products were ruined by three or four hours of holding of the packaged product at summer temperatures while awaiting freezing. In some operations, in which the freezing plant is located some distance from the packing plant, delays occur during transportation to the freezing plant. It must be remembered that any delays at this point are unthinkable.

Obviously methods which really quick freeze vegetables are best; but if the freezing operations are conducted in a sharp freezer, adequate provision must be made for forced circulation of air and *at no time should* the temperature be above 0 deg. F. The product must also be so placed that three sides are exposed to moving air. In other words, the

(*Turn to page* 357)

[1]See Tressler and Evers, "The Freezing Preservation off Fruits, Fruit Juices and Vegetables," p. 228. Avi Publishing Company, 31 Union Square, New York City. 1936.

At this pea canning plant the building shown was erected recently to house the pea freezing operations separately from all other plant activities.

Use of "INFORMATION BUDGET"

Avoids Needless Production-Sales Controversy

By W. R. CARLTON
Springfield, Mass.

IN AN ARTICLE in FOOD INDUSTRIES for August, 1937, reference was made to the differences of opinion which existed between a live sales manager with definite plans for an intensive drive, and an equally live and aggressive production manager who felt that the proposed expenses were prohibitive. The situation was typical. It is one found at times in every live organization. Aggressive management thrives upon it. Efficiency demands it. But in this particular case, the friction did not seem to promote real efficiency. Let us consider what was wrong.

A small business may be owned and operated entirely by one man who buys, supervises manufacturing, sells the products, and cares for the money. But as the business grows he cannot attend to all of the details, so he hires men to look after various activities for him while he remains the chief to whom all are answerable and the authority who determines, in final analysis, the policies of the company. That is a sensible situation. That there should be harmony between these executives is evident. That the chief must be wise and sagacious is also quite evident. So in thinking through the problem of the production manager, perhaps it will be well to begin by thinking over the respective qualities and knowledge which seem to be necessary for the chief executive, the sales manager and the production manager to possess in order to arrive at a satisfactory and profitable solution of the difficulty.

The wise and proper decisions of a chief executive are not, in the long run, merely cursory opinions and snap judgment. They are based upon real knowledge of the business. He should be able to visualize just what the result of his decisions will be. True, he frequently makes errors, but the fewer he makes the greater he is.

Here are some of the more common things which a chief executive should know in order to function to the best advantage of all concerned. He should know the condition of the company financially. It is necessary that he be familiar with the budgeted plan of operation (either in a regular formal budget or some simpler plan). He must be familiar with the funds available for the complete sales-advertising campaign under consideration. He must know how much he has available to carry on the additional manufacturing activities resulting from the sales activities. He must know how much in capital funds he has available for special machines or equipment necessary to aid the campaign. He would be wise to consider the effect which the proposed expenditures, both capital and operative, inclusive of the special expenses or capital expenditures which must be borne to promote the campaign, will have upon the balance sheet at the end of the period, whether successful or unsuccessful.

Then there is the problem of financing the increase in business, entailing greater purchasing, larger payrolls, and heavier expenses all along the line. Has he the funds; is it advisable to borrow, and also, can he borrow?

Then he must determine through his own experience and judgment and the knowledge of his plant capacity whether or not his sales department may oversell his plant's ability to produce. But always in the background he must remember the constant requirement of keeping the balance sheet relationship in proper ratio.

Consider the sales manager and a few of his problems. He must know his sales budget and how much in funds he has available for his campaign. He must know his market, the number of potential buyers and how they can be reached. His estimates of the probable sales results are highly important, for upon them rest important financial and production plans. The sales manager, too, decides upon the quotas for salesmen and territories. He must know the condition of his sales force and of their probable capacity for work. He must be able to estimate with reasonable accuracy the cost of the campaign he designs to use (this fits his budget).

Now, for a moment's thought on the production manager. As a result of the approved information regarding sales activity and campaign requirements, he furnishes data governing purchase requirements and the costs of machine requirements or alterations necessary to carry on the work. He furnishes cost data applicable to varying production schedules and comments upon costs of special machinery, machinery alterations or additions, and also gives personnel requirements for his production schedules. He determines whether or not his production facilities are equal to sales requirements. His estimates and figures go into the general budget or plan of operation of the business.

A "budget" has been mentioned because modern methods need such a plan to help simplify their problem and guard their business financially. But there is another budget which should be a part of every business, and that is an "information budget." This functions in a series of meetings at which all problems are fully discussed and necessary decisions arrived at. Every executive should comprehend fully the problems of his fellow executives as far as they affect him or his department.

In the case of the sales and production managers mentioned in the article referred to, then, we find them both apparently uninformed and, as a result, at odds with each other and the program. The chief executive, if he is qualified as has been outlined, should explain fully to the production executive his decision to proceed with the sales department plans. For, if the special equipment resulted in a loss for the whole campaign, it was obviously absurd to proceed, as the production manager claimed. While, if there were advantages which resulted in a permanent good to the company, the machine expense might well be charged off over a period of years and the pro-

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How STABILIZERS *Work*

Smooth, uniform, homogenous texture and appearance follow the correct use of stabilizers in whipped, emulsified and other liquid foods.

By B. I. MASUROVSKY
Certified Laboratories, Inc.,
New York, N. Y.

▶***Employment of stabilizers in ice cream mix has been instrumental in improving ice cream. The same beneficial actions of the stabilizing agents that are responsible for this improvement can be obtained by using these ingredients in other foods. In this article the author tells what the functions of a stabilizing agent are and how stabilizers are used. The industries that can realize these benefits include, among others***

Chocolate Milk
Citrus Fruit Preparations
Dairy Products
Ice Cream
Ice Cream Mix
Salad Dressings
Tomato Products

BECAUSE THE MODERN TREND is toward transparent food containers, there has developed a demand for the improved appearance of many food products. This is especially noticeable with liquid foods, particularly whipped or emulsified foods, including such foods as tomato products, citrus fruit preparations, salad dressings and dairy products. Along with this trend, has gone the demand for improved texture. To give these foods a smooth, uniform and homogenous appearance and texture, it has been found that the use of so-called "stabilizers" is essential.

Stabilizers aid in the absorption of a good portion of water, thus helping to avoid what is known as "watering off" or "wheying off," that is, the separation of the food into layers of the different constituents. Another function of a stabilizer is to provide colloidal protection against crystallization or "graining." Also, stabilizers increase the stability of an emulsified or whipped product, helping to maintain firmness of structure or body in the finished food. Finally, in some food preparations, stabilizers prevent the formation of sediment by keeping solid particles in suspension.

The most striking example of the use of stabilizers is in the manufacture of ice cream, sherbets and water ices. Following is a detailed description of the evolution of stabilizers in the ice cream industry, presented as a specific example of how stabilizers work and of their importance.

Until recent times, the word "stabilizer" was not in the vocabulary of the ice cream maker. Rather, he used the words "binder" or "filler." But with the advance of time a new conception of the make-up of an ice cream mix was established. It was no longer a mere combination of cream, milk, condensed milk, sugar and gelatine. It was recognized as a highly complex colloidal system.

The introduction of homogenization proved a boon to this newer phase of ice cream making, aiding in the establishment of a very essential step in the preparation of a homogenous colloidal ice cream mix.

This marked improvement affected not only the large scale manufacturer, but also the retail manufacturer of so-called "home made" ice cream. He could not afford to install a homogenizer, but he recognized the superior value of homogenized ice cream mix, preferring to buy ready-made ice cream mix rather than to continue himself to mix the cold milk ingredients with sugar and "filler."

Of course, the process of homogenization is not in itself sufficient to bring about the desired results expected from an ice cream mix. The balancing of the ingredients and composition are essential to produce proper results, and the use of a stabilizing agent has become almost a necessity in the manufacture of a homogeneous ice cream mix.

The term stabilizer arises from the use of these materials in emulsions. It is a well-known fact that in making an emulsion it is necessary to use an emulsifying agent in order to have the emulsion stay put. For instance, in the preparation of pharmaceutical emulsions, gum tragacanth is commonly used as an emulsifying agent. It makes the emulsions more or less permanent, i.e., stabilizes them. Hence the term "stabilizer."

In the case of an ice cream mix, the resulting homogeneous system is not only an emulsion of butterfat and sugar solution, but also includes the suspension of milk serum solids such as casein and albumen, along with egg solids and other solid ingredients. The scientific explanation of the need of a stabilizing agent in dairy creams was given by Dr. Palmer in a paper presented before the World Dairy Congress as follows: "The cause of the failure of homogenized cream to whip is no doubt due to the fact that the increase in surface area of the fat causes the adsorption of such a large proportion of plasma colloids that there is insufficient of these substances left for the stabilization of the foam.

(*Turn to page 363*)

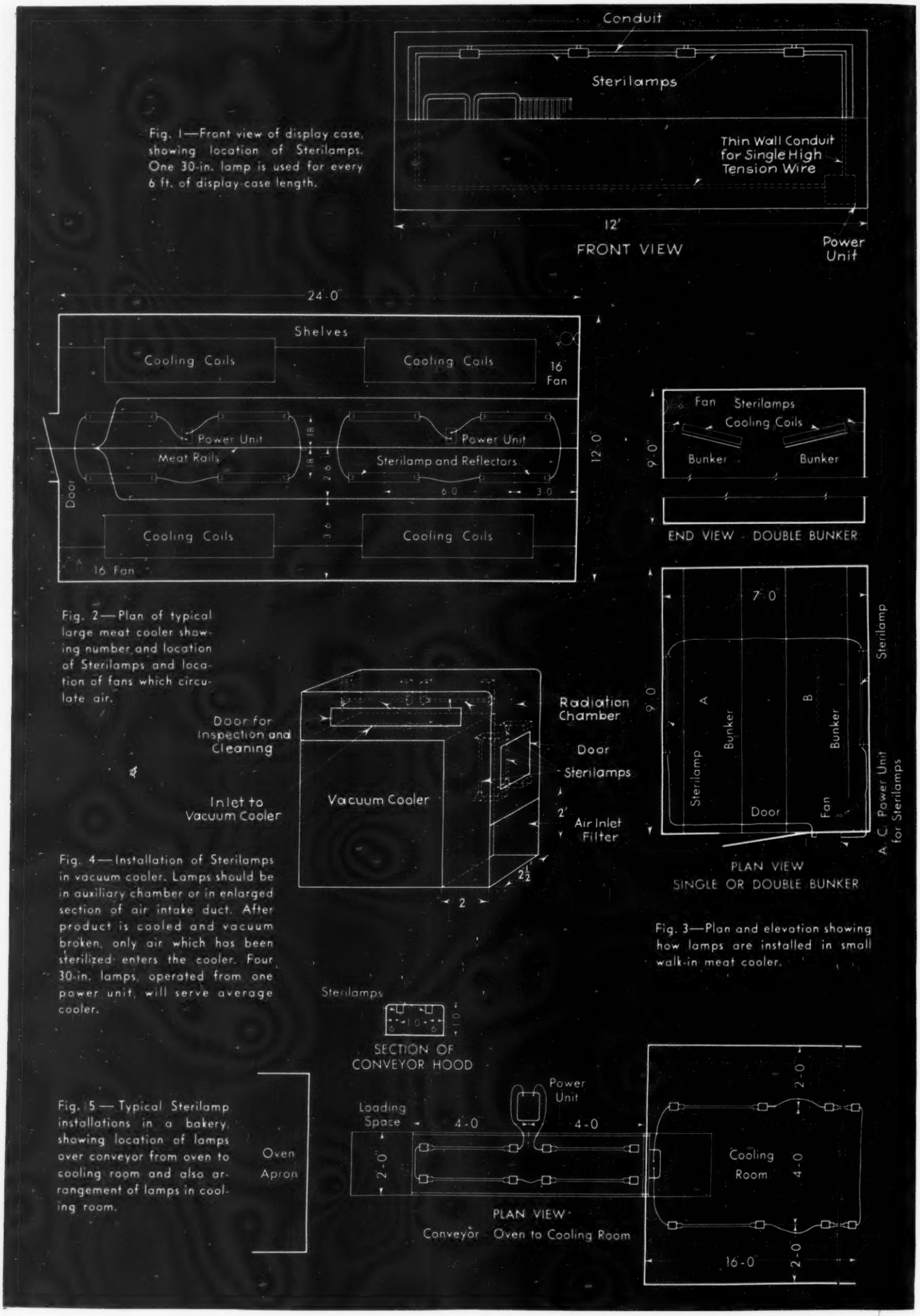

Fig. 1—Front view of display case, showing location of Sterilamps. One 30-in. lamp is used for every 6 ft. of display case length.

Fig. 2—Plan of typical large meat cooler showing number and location of Sterilamps and location of fans which circulate air.

Fig. 3—Plan and elevation showing how lamps are installed in small walk-in meat cooler.

Fig. 4—Installation of Sterilamps in vacuum cooler. Lamps should be in auxiliary chamber or in enlarged section of air intake duct. After product is cooled and vacuum broken, only air which has been sterilized enters the cooler. Four 30-in. lamps, operated from one power unit, will serve average cooler.

Fig. 5—Typical Sterilamp installations in a bakery, showing location of lamps over conveyor from oven to cooling room and also arrangement of lamps in cooling room.

How to Apply
RENTSCHLERIZING

What it costs. How much it saves

PART II

By H. S. BROADBENT

Assistant Manager, Special Products Division, Westinghouse Electric & Manufacturnig Co., Bloomfield, N. J.

IT IS SURPRISING how little ultraviolet energy is required to kill bacteria and mold when the radiation is of the proper wave length. The Sterilamp radiates over 80 per cent of its energy in the region of the ultraviolet spectrum of maximum efficiency. And one 30-in. lamp, for example, is sufficient for 30 sq.ft. of area in a meat cooler. This lamp consumes a mere 14 watts of power.

The amount of radiation required for lethal effects varies, of course, with different kinds of bacteria, molds and yeast. Thus, while the amount of energy required to destroy a typhoid germ registers seven "clicks" on the Rentschler ultraviolet meter, that required for black mold registers 1,000 clicks. It takes about 8 seconds for the 30-in. Sterilamp to kill 95 per cent of the typhoid germs in clear water at a distance of 4 in. But the typhoid germ is relatively easy to kill. At the same distance, the Sterilamp requires about 19 minutes to destroy black mold. Other times required at 4 in. include: *B. coli,* about 23 sec.; *B. subtilis,* 28 to 34 sec.; *Catarrhalis,* 98 to 116 sec.; *Staphylococcus aureus,* 23 to 28 sec.; *Staphylococcus albus,* 25 to 29 sec.; *Coccidia,* about 5¾ min.; yeasts, 17 to 34 sec.; white mold *(Penicillium)* 6 to 12 min.; *Rhizopus nigricans,* 4 to 8 minutes.

But these statistics need not bother the man interested in practical application of the lamp, because the number of lamps needed to do a particular job, their location and other details have all been worked out, tested and approved. The accompanying table gives the number of lamps, temperatures and relative humidities for meat and bakery installations, the latter including conveyor and air-conditioning applications. Location of the lamps for particular applications is shown in Figs. 1, 2, 3, 4 and 5.

As applied in the meat industry, the Rentschler-James process involves four simple steps:

1. Install Sterilamps in the coolers, using one 30-in. lamp for every 30-40 sq.ft. of floor area (see Figs. 2 and 3).
2. Raise the temperature in the cooler up to but not exceeding 45 deg. F.
3. Circulate the air in the cooler by means of a fan.
4. Raise the relative humidity to 90 per cent.

Installed on the walls or ceilings, the Sterilamps serve to kill all mold and bacteria in the cooler or on the meat, so that mold or slime no longer appears. Once mold and bacteria have been killed, extreme low-temperature storage is no longer required. It is necessary only to chill the meat to a point where it loses its flabbiness and will cut neatly.

Circulation of the air in the cooler is important. It serves to maintain the entire cooler at a more uniform temperature and keeps the air continually flowing over the Sterilamps and the meat to kill the air-borne bacteria and mold, *even on the surfaces not directly exposed to the radiation.* The fan, which should be of a capacity sufficient to circulate the air in the cooler every 2 minutes, is preferably directed on the cooling coils to keep them free of condensation and should never be placed so that the direct draft falls on the meat or on the Sterilamps.

In very large warehouse-type re-

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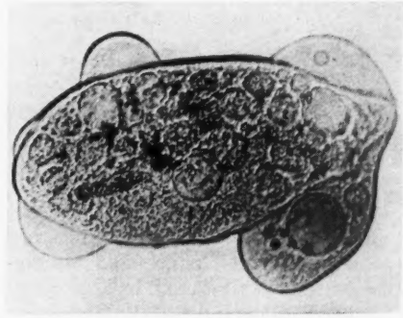

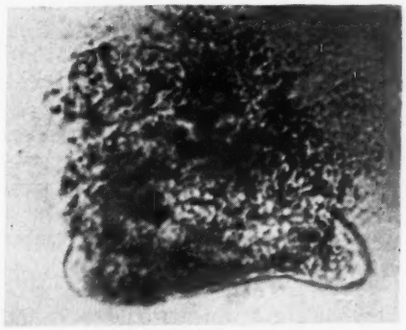

What ultraviolet "death ray" does to a Paramecium. Top, group of the microscopic animals, showing original shape. Center, one which has been exposed to ultraviolet, showing swelling and formation of blisters. Bottom, Paramecium bursts and is dead. (Magnification is greater at center and bottom than at top.)

▶ ***Part I of this article, "A New Process Goes to Work," appeared in the May issue of* FOOD INDUSTRIES, *telling what food manufacturers and distributors are doing with this practical new tool called "Rentschlerizing." Part II tells how much ultraviolet radiation is needed to do a particular job and gives installation data and drawings for the Sterilamp. Costs and savings are also covered. This information is of practical value to***

All Food Manufacturers and Distributors

UNREACHED MARKETS for *Baked Goods*

Plans—Causes—Suggestions

For Reaching that $500,000,000 Sales Increase

PART III

By EUGENE SZEPESI

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WITH the unreached potential sales volume for baked goods amounting to $500,000,000 a year, the industry could well afford to formulate constructive plans for the capture of this potential business. There is nothing visionary about it, as long as the industry does not try to change the consumers' desires to suit the technical and economic convenience of the industry. Plans with a promise of success should seek to change the industry and its practices to meet the social and economic developments of the day, and also the desire of the consumers.

The trend for every commodity, whether of the durable or the consumable kind, is toward improvement of the quality and increase in the variety. The baking industry is one outstanding example, where this principle has been consistently violated. Large unit operations and broadened distribution brought about a competition that has demanded intensified means to offset the mounting costs of distribution. Hence, standardization, substitution and mechanization have been used to lower the costs to a point of indiscrimination. As long as there has been room for territorial expansion, the ill effects of this method were concealed below the surface of events. But this is no longer possible because the industry has reached the point where the lack of variety, and the present degree of quality has brought the consumption of bread to our irreducible minimum. People eat no more bread than they actually must. Other foods, having greater flavor appeal, are ready to fill the gap.

Indifferent flavor, low quality and lack of variety, notwithstanding the low price of bread, will satisfy only the minimum purchasing power requirements, and the balance above the minimum will flow toward products which offer greater consumer satisfaction.

Insufficient analysis of the basic social-economic changes, which affected the nutritional requirements and habits of our population, is one of the outstanding reasons for the absence of a constructive clear-cut picture of the industry's fundamental needs. The chart showing the decline of the per capita flour consumption, which is everlastingly put before the bakers, is *not* constructive information. It is only a historical-statistical yardstick on the total flour consumption and, though the bakers are large consumers of flour, they are not the flour industry.

The bakers' specific problem is that for certain definite reasons the public is not consuming as much of their products as the bakers know the public should. The bakers want to find out why this is so, and what to do to make the public consume more baked-products.

There can be only two reasons:

(*a*) The population needs less energy producing food.

(*b*) The population has other, more desirable foods.

This question of "lowered energy food requirements" is brought into discussion every time the bakers meet. It bobbed up during their last meeting as the problem of the harmful effects of the dieting and reducing fads upon bread consumption. It ended with the suggestion of a propaganda that bread products are not fattening. Business men should realize that no propaganda ever could, or ever will, alter the consequences of basic economic changes. It's like patching up the parted plaster seams of the ceiling when the trouble is a crack in the foundation.

There are only two such basic economic changes which would make the population require less energy producing food.

(1) *The numerical change in the ratio of children and older people to the total population. There was such a change within the last generation and it would affect bread consumption. The fact is, however, that the crisis of this change as far as bread consumption is concerned has already passed 30 years ago.*

Here are the facts:

Population Ratios, Per Cent of Total

	1890	1900	1910	1920	1930
Under 20 years of age	46	44.3	42	40.7	37.8
Between 20 and 50 years	41.3	42.2	44	43.9	44.9
Over 50 years of age	12.7	13.5	14	15.4	17.3

Coefficients* of Food Requirements in Relation to Population Percentages

(Based on Du Bois and Cathcart Relative Factors)

	1890	1900	1910	1920	1930
Under 20 years of age	32.8	28.8	27.4	26.5	26
Between 20 and 50 years	38	38.8	40.5	40.4	41.3
Over 50 years of age	10.7	11.4	11.8	13.	14.6
Total	81.5	79.2	79.7	79.9	81.9

* The word "coefficient" is not used here in the mathematical sense, but as defined for expressing the amount of a physical change.

While these coefficients have persistently declined for those under 20 years of age, they have just as persistently increased for those between 20 and 50, and also for those above 50 years of age. The crisis came in about 1910, and by 1930, the increased number of living persons over 50 years of age has not only balanced the mag-

Correction: Please Note

In Part I of this article, pages 197, 198 of FOOD INDUSTRIES for April, 1938, the legends on the two charts were transposed through an error in printing. The correct legend for the chart at the top of page 197 will be found beneath the chart on page 198. And the legend under the chart on page 197 belongs with the chart on the succeeding page. The legend for the map is correct as printed.

nitude of consumption lost through the lesser number of people under 20, but actually has increased the potential consumption.

So there is nothing in this "change of population—bread consumption reducing theory." It's dead; it died 30 years ago.

(2) *The need of less energy producing food, because of the technological reduction of the human effort requirements.*

The reason for this decline has been practically conceded by every economist, but this is not yet constructive information, unless the bakers know how much this decline actually amounted to. Only then can a constructive remedy be provided—not for the elimination of the decline, because this cannot be eliminated, but for the adjustment of the products of the baking industry to balance the harmful effects of the decline.

This decline can be measured because we have reliable consumption statistics for all our basic commodities and also of their corresponding calorie values. In fact, the author has measured these factors, because without tangible facts on this consumption factor, it would not be possible to come to a constructive conclusion upon the future needs of the industry.

In making this computation, the calorie values of about 50 food staples were considered, grouped into classes and weighted in accordance with their relative consumption strength in 1900 and 1930. The summary is given in the following table.

PER CAPITA CALORIE CONSUMPTION

Year	Grain and Grain Products	All other Food Products	Total Food Products
1900	1475	1150	2625
1930	908	1515	2423
Decreased consumption of calories in 1930	567		202
Increased consumption of calories in 1930	——	365	——
Per cent decrease in 1930	-38.4%		-7.7%
Per cent increase in 1930	——	+31.7%	——

So there is a difference. The technological, social and economic changes have affected the food consumption of our population. It means a 7.7 per cent reduction in the total calorie consumption per capita. It brought about a 38.4 per cent reduction in grain and grain-product consumption and a corresponding increase of 31.7 per cent in all other food product calorie consumption.

Does this mean the doom of the baking industry? Not at all. Not two persons out of a hundred in our population know anything about metabolism. People eat what appeals to them, what tastes better, what is the best, and what they can buy for their money.

As far as the basic raw material of the baker is concerned, flour must remain the principal ingredient of their products. Hence the improvement of the quality of the flours is a desirable element. The current slight improvement of per capita consumption of flour should not be taken too optimistically as signifying the end of decline. This caution is needed because much of the improvement is due to the readjusted price relations with respect to other foods. During the first part of the depression many of them were below their normal production costs and for this reason forced the wheat product consumption levels below their normal line.

From the bakers point of view, the quality factor as represented by flour itself, though desirable, is only one of the many possibilities toward which the industry must reach out for the greater share of the consumer's food dollar. Many of the improvements must come from the bakers themselves.

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The Baker's Dozen of "Don'ts"

1 **DON'T worry about the decline of flour consumption. You cannot prevent the natural consequences of economic and social changes.**

2 **DON'T believe that because flour consumption is on the decline, the sale of baked products must follow the same curve. There is still a HALF-BILLION dollars worth of potential annual consumption of urban and non-farm rural population to go after.**

3 **DON'T presume that, because the consumers refuse to buy more of your present products, they wouldn't buy more if your products were better —even at a higher price.**

4 **DON'T believe that a "bigger loaf for less money" is an inducement to the majority of the consumers. A better but smaller loaf for the same money will make people eat more bread—and like it.**

5 **DON'T try to dress up products, intended for a 24-hour consumption, so that they will appear "fresh" for too long. Make smaller loaves for smaller families, and let them buy the bread oftener.**

6 **DON'T be just a "converter of flour." Use whatever good ingredients that are desirable to inject variety, and make your product wholesome, palatable and appealing.**

7 **DON'T be afraid to use your imagination in devising new shapes and flavors for your products.**

8 **DON'T use packaging to a point of indiscrimination. The consumer cannot eat the paper and printer's ink. After all, only what's inside of the package counts.**

9 **DON'T make your product displays blend with the general scheme of grocery merchandising. You are not selling canned beans or soap powder, but bakery products, where attractive visual appeal is of prime importance. Let the air-conditioning industry get busy devising for you, conditioned cases to display your product "in the nude," in prime condition, no matter what the weather may be.**

10 **DON'T rely on toasting alone to bring out the quality of your product. Make bread smell, taste, and butter well without toasting.**

11 **DON'T encourage pre-slicing. It has done much to reduce bread consumption because people count the slices they eat.**

12 **DON'T make people's mouths water when they read your advertisements, and then disappoint them.**

13 **DON'T believe that because today you haven't the rural market you cannot get it tomorrow. Go earnestly after it.**

OLIVE OIL . . . *Valued For Its Flavor*

By WALLACE H. DICKHART
Chemist, Olive Oil Association of America, New York, N. Y.

WHETHER it is used as a salad oil, a cooking oil, a blending oil or an ingredient oil, the basic commercial value of olive oil lies in its distinctive flavor.

Aroma and color are accompanying virtues. The oil that has the highest flavor quality will also have the pleasing aroma and the pale yellow or slightly tinted golden color that identifies the expertly selected "virgin" olive oil. The greenish golden color can be imitated or synthesized but the combination of flavor and aroma of the highest quality oils defies faking.

However, the commercial market demand for olive oil is so great that the uninitiated are likely to be supplied with a variety of oil blends which are sold as "pure olive oil" simply because they are labeled "olive oil." When the non-expert purchases olive oil he is likely to be interested first in the price of the oil and secondly in its flavor and aroma. Should he be an American he will very probably prefer a bland or mildly flavored olive oil because the American trade has been accustomed to refined deodorized oils.

Unfortunately, oils supplied to such non-discriminating markets need only to look like olive oil, be so designated by label, and sell within an acceptable price range. Only in so far as all olive oils are popularly supposed to possesse virtues of flavor and aroma, do these oils have their market value based on flavor and aroma.

Contrasted to this non-discriminating market is that found among peoples from Southern Europe. They prefer an oil with a pronounced olive flavor and odor, and pride themselves on being in possession of such a type of olive oil. In the case of high quality oils, the quality of the flavor determines the market value of the oil.

Prior to its civil war of more than a year's duration, Spain was the most important olive-growing country in the world. It produced between 45 and 50 per cent of the world's supply of olive oil. The next country in importance is Italy. The other countries, in their relative importance, are Greece, French North Africa, and Portugal. All the rest of the world produces about 5 per cent of the total.

On the basis of flavor and, incidentally, aroma, color, and body, olive oils are classified as edible, and commercial or inedible. Olive oil is shipped in steel drums, wooden barrels, and six, one, and less than one gallon tinned cans. Olive oil foods are shipped in tank ships, tank cars and steel drums.

Because of the variations in the oils wanted by people of different nationalities, packers of olive oil have blended the several grades of oil so that olive oil may be had in a strong, medium or light type—as they are known in the trade.

These grades are highly important to food manufacturers or packers whose product contains olive oil as an essential constituent or ingredient. In all, there are nine grades of olive oil; five of them are edible and four are inedible.

Of the five edible oils two are of the pressed grades, one is of the blended grade and two are of the refined grade. The two pressed grades are known as "first" and "second" pressed. The "first" pressed oil is one which has not been subjected to any treatment and is obtained by the pressing of crushed sound, ripe olives without the use of warm water but followed by decantation and filtering.

"Second" pressed oil is obtained by a second pressing of the press cake from the first pressing to which warm water has been aded to aid in the removal of additional oil. To this press cake aditional water may be added prior to removal of still more oil known as "third" pressed oil. This third pressing is rarely done any more.

When "off-grade" olives are given a "first," "second" and "third" pressing the resulting product is known as "commercial" oil or "lampante." The product is a clear oil containing not less than 3 to about 20 per cent free fatty acid, calculated as oleic acid.

Refined oils are usually made from oils with free fatty acid content of over 2 per cent and are treated in the same manner as the extracted oils which will be discussed later. They do not contain any traces of solvent

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OLIVE OILS
Their uses and proposed uses

USES	Edible: Pressed Virgins: First	Edible: Pressed Virgins: Second	Edible: Blended 70% Virgin 30% Refined	Edible: Refined (Neutral): Used as a blend with extra virgin olive oil	Inedible: Extracted: Press Cake	Inedible: Extracted: Olive Oil Foots	Inedible: Extracted: "Acid Oil"	Inedible: Commercial (Lampante) 1% to 5% F.F.A.
Legend: ○—not used ●—used ⊕—preferred								
FOOD MANUFACTURE								
Cheese greasing	○	○	○		○	○	○	●
Confectionery	○	●	○		○	○	○	○
French dressings	●	●	○		○	○	○	○
Mayonnaise	●	●	○		○	○	○	○
Potato chips	●	⊕	○		○	○	○	○
Salted nuts	●	⊕	○		○	○	○	○
FOOD PACKING								
Anchovies	●	⊕	○		○	○	○	○
Sardines	●	⊕	○		○	○	○	○
Sauces	●	●	○		○	○	○	○
Tuna fish	●	⊕	○		○	○	○	○
HOME USE								
Flavoring	⊕	●	○		○	○	○	○
Frying	○	●	○		○	○	○	○
Salad dressing	●	●	○		○	○	○	○
Shortening	●	●	○		○	○	○	○
MEDICINAL & COSMETIC								
Dressing for burns	⊕	●	●		○	○	○	○
Eyebrow sticks	●	⊕	●		○	○	○	○
Face powder	●	⊕	●		○	○	○	○
Hair tonics	●	⊕	●		○	○	○	○
Laxatives	⊕	●	○		○	○	○	○
Hand lotions	●	●	●		○	○	○	○
Lip sticks	●	●	●		○	○	○	○
Ointments	●	●	●		○	○	○	○
Pomades	●	●	●		○	○	○	○
Shampoos	●	○	●		○	○	○	●
Shaving creams	●	○	●		○	○	○	●
Soaps	○	○	○		○	○	○	●
Solvents	○	○	●		○	○	○	●
Suppositories	⊕	⊕	●		○	○	○	○
Vanishing creams	○	●	●		○	○	○	○
Baby oil	⊕	●	○		○	○	○	○
NON-FOOD INDUSTRIAL								
Electrical resistances	○	○	●		○	○	○	○
Emulsions	●	○	●		○	○	●	●
Lubricants	○	○	●		○	○	○	○
Soaps and soap powders	○	○	●		○	●	●	●
Sulphonated oils	○	○	●		○	○	○	●

Frozen foods are opening the gates for the distribution of packaged ice cream in grocery stores

FROZEN FOOD DISTRIBUTION *Will Be Different*

By IVAN C. MILLER
Distribution Editor, Food Industries

THE PROBLEMS OF DISTRIBUTION are now the most thorny problems of the frozen food industry. The cost of distributing most food products usually exceeds the cost of manufacture, frequently exceeds the cost of manufacture plus the cost of raw materials. This, at present is particularly true of frozen foods because of the necessary and expensive refrigeration and temperature control from manufacturer to consumer, regardless of the time interval involved.

Not only does the cost of frozen food distribution present problems, but the method of distribution as well. The mechanics of distributing frozen foods has introduced problems new in food distribution, many of which are as yet unsolved. Attempts to solve these problems have evolved new food distribution technic resulting in strange distribution combinations and queer bedfellows in the field of food distribution. Fresh fruit and vegetable dealers have developed into distributors of meat and poultry, old line dry food wholesalers are now distributing fish, meats and fowl. Dairy companies are distributing fruits and vegetables, meat, poultry and fish.

The future effect of frozen foods on the channels of distribution promises to be far reaching. This new industry threatens to materially change many existing distribution channels. Not only do manufacturers face real problems in selecting the most satisfactory type of distribution for their products, but many distributors face the very real problem of entering a new type of business or vainly fighting for an increasing share of a diminishing market.

The competition of frozen food has been most keenly felt by those who sell to institutions, railroads, steamship lines, hospitals and the better hotels and restaurants. In some parts of the country, even roadside stands and hamburger lunchrooms buy their ground meat in frozen patties ready for the griddle. Frozen hamburgers, frozen fish steaks, and similar products are kept by these prepared food outlets in ice cream cabinets. These frozen foods hold favor with the roadside stand because they are uniform and sanitary, because they require minimum labor in preparation, and because a large stock can be carried without the danger of spoilage.

Institutions have absorbed most of the production of quick frozen foods during the last few years. The household consumer market is as yet practically untouched. Both the fresh produce distributor and the canned goods wholesalers distributing to the institutions have suffered from the competition, the fresh produce distributors most. In self-defense, if for no other reason, a few produce distributors are now engaged in selling and distributing frozen foods, in competition with their own fresh produce. Other produce dealers may be expected to follow.

The old line grocery wholesaler is not geared by precedent for frozen food distribution except in that the

(Turn to page 334)

SALES STIMULATORS

These food pages appearing in the forthcoming July issues of the Women's Magazines will bring increased sales when used on posters in retail stores.

TESTS MADE with the cooperation of both independent and group retail organizations to determine the promotion value of women's magazine food pages have been reported in earlier issues of FOOD INDUSTRIES. These tests have proved two facts. Retailers generally welcome this type of display poster more than other types, and cooperate in giving it an opportunity to produce. This type of poster, made by mounting reprints of the illustrated food pages of the women's magazines, produced pronounced increases when used to stimulate sales.

As a result of these tests FOOD INDUSTRIES arranged with the women's magazines to obtain advanced proofs of these pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of retailers at or about the same time the magazines reach their readers.

Mounted reprints of these food pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

SINGLE PAGE

1,000 to 1,999 inclusive each	15c.
2,000 to 2,999 inclusive each	12c.
3,000 and over each	10c.

TWO-PAGE SPREAD

1,000 to 1,999 inclusive each	25c.
2,000 to 2,999 inclusive each	18c.
3,000 and over each	16c.

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products or write to the distribution editor of FOOD INDUSTRIES.

Each poster will carry the printed line "As seen in the July issue of . . . . . Magazine." The manufacturer's own selection of caption or "selling slug" such as, "Try these recipes suggested by Good Housekeeping," "Four menus with frosted foods," "Ice Tea season is here", etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.

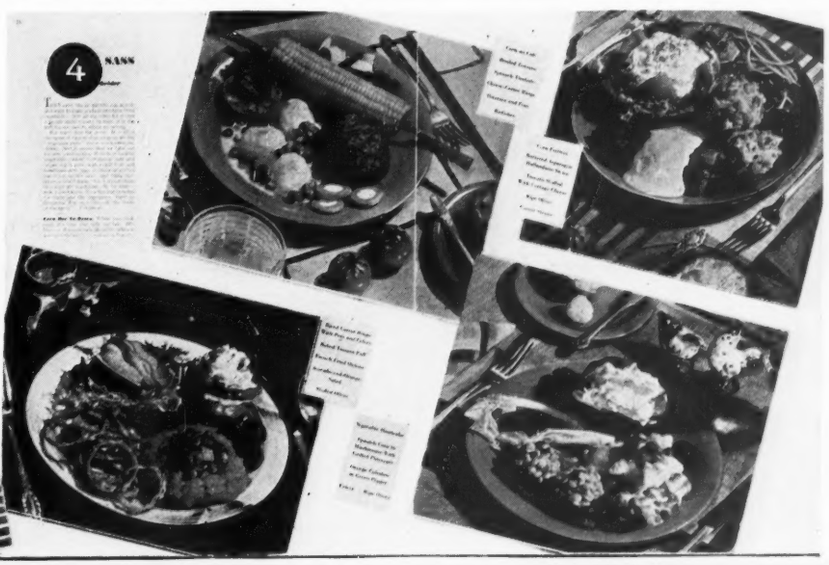
1—GOOD HOUSEKEEPING: Full color spread may be used to promote macaroni, cheese, tea, canned date and nut bread, mushrooms, peas, cherries.

2—WOMAN'S HOME COMPANION: Full color page to promote melons, dates and maraschino cherries.

3—PICTORIAL REVIEW-DELINEATOR: Two-color spread to promote ice cream, canned pineapple, berries and marshmallow.

4—LADIES HOME JOURNAL: Full color spread suitable for promoting the sale of quick frozen or canned corn, spinach, peas and asparagus, also canned mushrooms and pineapple.

5—McCALL'S: Full color spread featuring tea. Also suitable for the promotion of canned pineapple.



wholesaler's salesmen call on the grocery trade. Generally, perishables that require cold storage warehousing are not among the staples of the full-line grocery wholesaler or jobber. Few of the grocery wholesalers or jobbers have as yet suffered severely from the competition of frozen foods. Few of them are apparently concerned for the future of canned foods. There are several of the larger wholesale groceries, however, already distributing frozen foods or preparing aggressively to enter this field. These are the wholesalers with national or wide territorial distribution of products under their own well-established private brands. The plan of some of these wholesalers is to distribute frozen foods packed subject to their inspection and to their specifications under their own label. Most of these distributors anticipate a full line of frozen foods—fruits, vegetables, poultry, fish and meat.

As a group, the brokers have been more aware of the importance of frozen foods than the wholesalers, possibly because the accumulation of surpluses by those freezing foods has forced these producers to turn to the brokers for relief. Some of the largest national brokerage houses are preparing to function in the distribution of frozen foods as they do in other packaged groceries.

Among those, whose present distribution system appears to be best adapted to frozen food distribution are those engaged in store-door delivery, wagon jobbers and dairies. The wagon jobbers have an advantageous position in building a market for frozen foods. Wagon jobbers are located geographically so as fairly well to blanket the major markets of the country. The wagon jobber's driver is a regular and frequent caller on the retail outlets. He is on intimate terms with the store owner. He is regarded by the retailer as less a salesman, more a service man. The wagon jobber should be an advantageous instrument to the manufacturer in opening new outlets, both retail and institutional. Even though frozen food distribution seems a natural for the wagon jobber, few have entered the field. Many, however, are waiting until some of the growing pains which are sure to afflict a young industry are over and until there is more widespread household consumer acceptance before they attempt to get their share of frozen food distribution. This next year will probably see quite a few wagon jobbers bidding for territory and a chance to eliminate one of the evils that is beginning to creep into the industry, the overloading of outlets.

The dairy companies are already engaged in frozen food distribution, some acting as agents for manufacturers, one at least, Fairmont Creamery, actively building distribution for its own trade-branded line of frozen foods, fruits, vegetables, fish and poultry. Most of the other dairy companies distributing frozen foods are acting as distributors in the mechanical end of the delivery operation, warehousing, especially in small communities, and making store-door deliveries.

Frozen food distribution presents a real problem to the dairy, especially those which manufacture ice cream. The ice cream manufacturer has long realized that the time must come when ice cream, especially packaged ice cream, becomes a staple item of the grocery store. The day seemed far distant until the frozen food cabinet made its appearance in the grocery store. Many grocery stores with frozen food cabinets will soon have the equipment for handling ice cream and housewives will soon be buying ice cream with other frozen foods. The question is, who will supply the ice cream to the grocery store. Logically, the same distributor who delivers the frozen food, at least that is the reasoning of some of the dairy companies. Frozen food appears to them to be the entering wedge or passport for ice cream sales through the grocery outlet.

There seem to be other advantages to the dairy company that enters into the distribution of frozen foods. The annual ice cream and milk plant slump is lowest when frozen food distribution is at a peak. The dairy whose distribution includes frozen food, as well as dairy products, should decrease average operating costs and operate without such costly annual distribution cycles. Then, too, several milk distributing companies have experimented with frozen milk to the extent where experimentation justifies the belief that frozen milk is the answer to great savings in the cost of milk distribution. These dairies believe in the future of frozen milk distributed through the retail store.

Residents of the Canal Zone, where cows are few and good milk scarce and expensive, have during the past year enjoyed the luxury of normal priced fresh whole milk furnished to them from Washington by the government. This milk, pasteurized and homogenized, is reduced in volume from half to a third by low temperature evaporation and frozen. Natural flavored whole milk is obtained from the concentrated frozen product in the Canal Zone by thawing and replacing the removed water. Distribution when obtained, of frozen milk through retail outlets promises to greatly reduce the cost of whole milk distribution.

In Canada, one dairy company has obtained satisfactory results, delivering frozen fruits on retail milk routes. Not only does the sale of frozen fruits increase the dollar volume per stop, it also increases materially the sale of cream. Household delivery of frozen food has made little progress in this country. However, one experiment is now in progress in New Jersey. The results of the study may in a measure determine the future of this type of frozen food distribution. All of these factors have encouraged the dairy companies to follow closely the developments in frozen food distribution and to be prepared eventually to take their place in the merchandising scheme along with other types of distributors.

There are hazards the ice cream manufacturer must consider before entering into the frozen food distribution —the training of route men for store-door delivery to the grovery trade, operation under closer market margins, adaptation to a credit structure different from that of the drug and confectionery trade, and, should they introduce a product of their own manufacture into the grocery store, ice cream, the reaction of their present customers in the confectionery and drug store field.

Canners, meat and poultry packers, and the fisheries have their share of distribution problems. Many of the manufacturers of frozen foods have huge advertising investments in their own brand name. The frozen foods they manufacture are, however, sold at present under a distributor's brand name. Canners and packers have welcomed the opportunity to reduce inventories and move surpluses profitably by freezing a part of the crop. Many of the large national brand manufacturers hesitate not only at the expense involved should they pioneer in frozen food distribution, but hesitate to be identified by their brand name to an industry until many more of the expensive headaches are over and many more of the producer, manufacturer and distributor bugs are worked out.

When, however, frozen foods have come into more general acceptance, furnishing real competition for canned foods, the present distribution picture will again be changed to accommodate the entrance of the brands and the distribution system of at least some of the large national advertisers.

Saving the Surface Of Motor Vehicles

Answers to Questions About Painting Them

IT IS NO SIMPLE MATTER to keep a fleet of trucks, exposed to rain, snow, sleet, mud and summer sun, in a spick-and-span condition, and do it without running up an exorbitant maintenance expense. One of the most important steps in this direction is to select a durable finish that is easy to keep clean. And there are several other problems to be solved, all of which are discussed in the following symposium by men who operate fleets in the food field.

Colors Follow Packages

In painting automotive equipment, we carry out the same color schemes as we do on our packages, without taking into consideration the durability of the colors. It is the writer's opinion that by following out the same type of advertising on the trucks, where this is possible, as is carried out on the packages, more advertising value is obtained than by resorting to flashy colors.

We have recently been using lacquer to paint our trucks and have found it to be very satisfactory. We do not have any regular time for painting our motor vehicles, but always keep them in good condition and have them repainted or revarnished when this is necessary. Scratches and scarred places are taken care of immediately. If the nature of the disfiguration is such that we cannot blend the paint for it in our own shop, we have the work done outside, because we do not operate our own paint shop.

The writer feels that a protective coating of wax over the finish, where this can be done, is an added protection. And experience with the smaller types of vehicles indicate that the expense is justified. This should be done at least twice a year—oftener would be better if you want to preserve the painting and lettering for a long period of time without making any change in your advertising appeal.—H. E. WENNAGEL, *traffic manager, The Wm. Schlüderberg–T. J. Kurdle Co., Baltimore, Md.*

Varnishes Trucks Often

The color which we have found to be most effective in resisting fading and dulling is what we call "Best Foods" red. Red is also the color which is easiest to keep looking clean; the most difficult color to keep clean is white. Even though flashy colors may not be as durable as some others, we think that their use is justified by their advertising value. In painting refrigerated trucks and trailers, we believe it is important to use a finish that is effective in reflecting heat from the body.

As to durability of finish, paint is relatively better than lacquer or enamel. We extend the life of the finish by a protective coating, and we prefer varnish to wax for this purpose. Our trucks are varnished every six months. In regard to frequency of repainting, our trucks are repainted when inspection indicates that it is necessary; a regular schedule is not followed. Minor disfigurations are retouched immediately, a spray gun being used for this.

Paint jobs on our motor-vehicle equipment are done outside.—WALTER S. PAPE, *Henry Pape, Inc., Long Island City, N.Y.*

A Satisfactory Finish

Our experience with motor-vehicle paint colors has been confined exclusively to red and white. All our rolling equipment is white with red lettering shaded in gray. Dupont's Dulux has proved very satisfactory as a finish for our motor vehicles. All our painting work is done with a brush, not with a spray gun.—E. BARBER, *general sales manager, Ice Cream Division, Abbotts Dairies, Inc., Philadelphia, Pa.*

Repaints Trucks Yearly

The most effective color for resisting fading and dulling is yellow or black. And the most difficult color to keep looking clean is white.

We do not think that the advertising value of "flashy" colors justifies their use when they are not as durable as other colors.

As to durability of finish, we have found enamel to be the best. In regard to the use of a protective wax coating over the finish, we do not believe this to be economical.

Repainting of our motor vehicles is done yearly. In retouching minor disfigurations of the finish, such as scratches on fenders, we employ a brush and not a spray gun. We find it economical to operate our own paint shop.—F. P. VAN TINE, *manager Elwood Coca-Cola Bottling Co., Inc., Elwood, Ind.*

Distribution QUESTIONS CLUB

TEMPERATURE *Important* in Summer Food Distribution

Various means available to protect foods in transit on long and short routes

THE COMING HOT SUMMER MONTHS require food distributors to protect their goods against wide temperature variations, both from the standpoint of protection against spoilage and to meet sales competition. Each year this competition becomes more keen. Slowly but surely those food distributors who for years used fleets of trucks with no provision for maintaining the proper temperature of their products are being forced by competition to adopt either insulated or refrigerated truck bodies.

Such bodies help to boost sales. With products of equal quality and price, the advantage of continuously delivering goods in prime condition is a sales asset of great value. Hence, we see the recent more rapid adoption of the insulated or refrigerated truck body for handling food products.

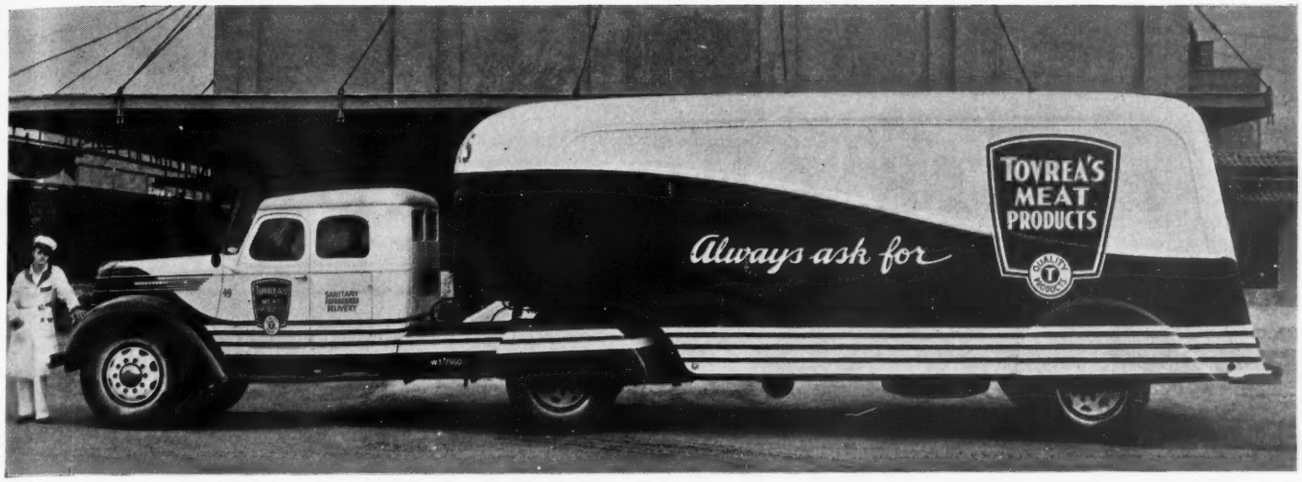
Fifteen years ago the refrigerated ice cream truck body and the advent of the mechanical iceless cabinet combined to spell the doom of the old ice-and-salt method of delivering ice cream. Since then there has been a continuous development of the method of insulation and the means of refrigeration, together with a demand for lighter, better looking, more streamlined bodies and trucks.

Development has been slower among the dressed-meat packers, prepared-meat distributors and dealers in dairy products such as butter, eggs, poultry, cheese and mayonnaise. But recent advances in quick-freezing processes have accelerated the use of refrigerated truck bodies on retail delivery routes. Even vegetable and fruit dealers are now using refrigerated bodies.

More detailed, semi-technical descriptions of such bodies have appeared in previous issues of FOOD INDUSTRIES. This short illustrated story spot-lights some of the most recent

Even the fruit and vegetable dealers are swinging to refrigerated bodies. Here's a 14-footer on a Ford, one of a fleet of eight used in Minneapolis.

LEFT, *one of the newest streamlined ice cream bodies, one of a standardized line of nine sizes featuring corkboard insulation with several types of refrigeration.* RIGHT, *the latest model of refrigerated body used by Blue Valley Creamery Co. for delivering butter, eggs, bacon and mayonnaise.*



A real streamliner! This ultramodern tractor and refrigerated trailer carries 10 tons of meat products and covers a 600-mile route twice a week out of Phoenix, Ariz. It is operated by two men, a salesman and a driver helper. Sales are made direct from the trailer and delivered on the spot.

uses and the modern, streamlined types of bodies now favored.

For example, take the latest Fitz-Gibbon & Crisp, Trenton, N. J., streamlined, 450-gal. ice cream body shown mounted on one of the latest International cab-over-engine trucks in one of the accompanying views. It is featured by the use of 6 in. of Armstrong corkboard insulation in double 3-in. layers, sealed with hot hydrolin. Several different means of refrigeration are available.

Next to the ice cream body is shown one of the new 8-ft. refrigerated bodies adopted by Blue Valley Creamery Co. for the delivery of butter, eggs, mayonnaise and bacon in the cities of St. Louis, Cleveland, Detroit and Chicago. It is insulated with Dry-Zero and is refrigerated with water ice carried in a bunker.

Directly above the ice cream and butter bodies is shown one of a fleet of eight trucks used by the Gamble-Robinson Co. to deliver fresh fruits and vegetables in Minneapolis. Each truck is insulated with 2-in. Dry-Zero blankets and refrigerated by water ice to maintain a body temperature of 45 deg. F.

At the top of this page is shown an ultramodern tractor and a 20-ft. refrigerated semi-trailer owned by Tovrea Packing Co., Phoenix, Ariz. Twice each week it covers a 600-mile route, starting out with 10 tons of meat. It is manned by a salesman and a driver helper. The meat products are sold direct from the trailer and delivered immediately. The body is refrigerated with dry ice and insulated with Dry-Zero in the sides, roof and ends and cork in the floor.

Another view shows one of a fleet of eight Internationals with refrigerated bodies used to deliver Mrs. Clark's mayonnaise in Des Moines, Iowa. Still another view shows one of the big ten-wheeled, 10-ton Autocars owned by J. Coyle to handle Birds Eye Frosted Foods between Boston, New York City and Bridgeton, N. J. Refrigeration is by dry ice. The body temperature is maintained at 15 deg. F.

A well-proportioned refrigerated body on one of the new Internationals as used to deliver mayonnaise in and around Des Moines, Iowa.

An interior body temperature of 15 deg. F. is maintained in this giant, ten-wheeled Autocar hauling Birds Eye Frosted Foods along the Atlantic seaboard.

Merchandising HINTS AND HURDLES

Price Cutting and Price Fixing

PRICE CUTTING by retail food stores is rampant, according to numerous reports from trade journals and trade associations. When hasn't there been price cutting in retail food selling? The difference now is that price cutting may be more prevalent, more "justified."

As the chains grew, they were termed by independents as price cutters even though they bought for less and could therefore sell for less. As voluntaries met chain prices, the voluntaries were price cutters to those independents not members of voluntaries. Some voluntaries are considered price cutters by other voluntaries.

For some years the super markets have been in the doghouse as "worst offenders." Their low overhead and operating costs have permitted them to sell at a profit for prices below competitors. The chains have adopted, with limitations, the super-market system, relentlessly in a few locations going the super markets one better. Floors or sections of several chains store warehouses have recently been open to the public for retail purchases at a reported 5 per cent mark-up. Here are many groups selling food to the public, each as often as possible cutting prices on competitors in an attempt to get a larger share of the family's food dollar.

Is this situation evil? If so, how can it be ended? To those who cannot meet prices it is evil because it hurts them. To those whose business thrives and returns a profit on low prices—so-called cut prices—the practice is justified—legitimate.

During the time of the guild system in Europe, prices on commodities were fixed by the guild. The penalty by law for price cutting was dangling from the end of a rope. This was a price cutting curtailment measure which ended price cutting, of course—NO, hangings increased.

Macy's have found a way to sell books at cut prices despite the New York Fair Trade law and the Miller-Tydings law which permits price fixing on books. If the method sticks—Macy's may find a way to evade maintaining price on other fixed price items.

Who in the food field wants price fixing—the manufacturer? Only those selling to private label distributors, whose sales of private label merchandise might increase as a result of the fixed price umbrella, would welcome the necessity of a fixed price on branded labels. Certainly brand owners would not benefit much nor long. Chains, voluntaries, super markets and warehouse outlets—would they prefer fixed prices? No, of course not! The bait that brings traffic into their stores would be gone. Creating a bait with private labels, if at all possible, would be expensive. Who, then, but the small independent is anxious for fixed prices? Is not, however, the small independent's benefit largely imaginary and at best short-lived? The independent's incessant cry of "Protect the little fellow, curb big business, end monopolies" is a demand for price-fixing. Will price fixing curb big business or end monopolies?

Business, big and little, with one breath denounces government interference, government regulation, government domination and with the next breath petitions the government for aid. If no restrictions by government, no regulation by government, no help from government were within the reach of business, either large or small, business would go ahead on the basis of free and untrammeled trade. Business in this country thrives on hearty competition. Take the conflict out of business and there is no business. The general application of price-fixing to the food field will be at best a costly experiment.

Percentage Increase in Population And Average Acres Per Commercial Vegetable Farm[1]

Since 1900

Year	Average Acres Per Commercial Vegetable Farm	Per Cent Increase Over 1900	Year	Population	Per Cent Increase in Population
1900	2.0 Acres		1900	75,994,575	
1919	3.0 "	50%	1910	91,972,266	21%
1929	4.5 "	125%	1920	105,710,620	33%
1937	6.0 "	300%	1930	122,775,046	61.6%
			1937	130,000,000[2]	71.0%

[1] The number of farms has remained fairly constant at approximately 600,000.
[2] Estimated.

Approximate Per Cent Increase in Commercial Vegetable Acreage by States

State	Per Cent Increase	From Year	To Year
North Carolina	600%	1919	1937
South Carolina	500%	1919	1937
Georgia	300%	1919	1937
Florida	300%	1919	1937
Texas	800%	1919	1937
Louisiana	600%	1919	1937
Oklahoma	500%	1919	1937
Alabama	400%	1919	1937
Mississippi	400%	1919	1937
Idaho	1100%	1919	1932
Oregon	800%	1919	1937
Arizona	700%	1919	1937
Washington	700%	1919	1937
California	350%	1919	1937
Minnesota	600%	1919	1937
Missouri	200%	1919	1937
Wisconsin	200%	1919	1937
Michigan	200%	1919	1937
Illinois	200%	1919	1937
Indiana	200%	1919	1937
Ohio	200%	1919	1937
Entire Country	300%	1919	1937

A Basis for Surpluses

ACCORDING TO a bulletin of the Bureau of Agricultural Economics, U.S. Department of Agriculture, approximately 1,500,000 acres were cultivated in 1919 to raise vegetables, other than potatoes and sweet potatoes, for sale. This vegetable acreage was on some 600,000 farms. In 1937, the number of farms growing vegetables other than potatoes was just about the same as in 1919. However, the acreage cultivated was close to 4,200,000 acres. The commercial

acreage of vegetables for fresh market shipment in 1937 was thus a little more than three times the acreage in 1919. The acreage of vegetables for canning was about twice as large, and the acreage in market garden crops and others, nearly 3.5 times as large as in 1919.

Not only has all vegetable acreage increased nearly three-fold in less than twenty years, but the yield per acre, because of more scientific methods, has also increased. Since 1919 (1920 Census) population has increased an estimated amount not to exceed 25 per cent, while vegetable production has increased more than 300 per cent. In spite of the improved warehousing and transportation that now bring vegetables, fresh or canned, within the reach of all, summer and winter, the increased acreage is the No. 1 factor contributing to the recurring vegetables surpluses and gluts.

Prick for Filene Bubble

RESULTS from the Filene experiments are coming in. The ships sent out are coming back with empty holds or profitless cargoes. The experiment with consumer cooperative department stores is not proving feasible, at least at present. The chief reason for the failure of the consumer type department store is largely due to the fact that the department store is an institution patronized largely by the upper crust and only represents about 14 per cent of family expenditures. Food is the one item common to all. Its regular procurement is inescapable by rich or poor. It is the item most bought by the poor, by the masses. Food represents from 30 to 50 per cent of the low income group family budget. The unsatisfactory results obtained through the Filene experiment will not act as a break to the consumer cooperative movement, but rather as an incentive to concentrate effort for expansion in the food field. Whatever skirmishes or battles are waged between established systems of distribution and the consumer cooperative methods, will be waged for the next few years mostly in the food field.

Sales Territory Atlas

THE DEPARTMENT OF COMMERCE published in 1927 an atlas of wholesale grocery territories, showing 184 primary wholesale trading areas in the United States. Since the 1927 study, trading areas have shifted. A new study now available is based on servicing 532,000 retail food stores, 66,000 general stores. In these sales territories there are 3,850 full-line, full-service and limited function wholesale grocery establishments. The atlas, which may be obtained from the Washington office of the Department of Commerce or any of its 25 district offices, price $1, should provide valuable aid to food manufacturers in the apportioning of their sales territories.

Keeping the Small Ones Small

SUPER-MARKETS discovered or uncovered the fact that consumers like self-service and whatever savings accompany it. Throughout the country, many progressive, even though small, independents have adopted self-service. Some small units employ self-service only in a limited way. Nevertheless, in the last few years, self-service has been the vehicle on which many small grocers have expanded their business. Few, if any, of these have reached proportions whereby they can assume the glorified title of super markets. If many other sections of the country follow the practice employed by Camden, N. J., these enterprising independents will not only be reprimanded for their aggressiveness but will also be compelled to abandon the self-service method, to accept retrogression to the outmoded. Last month Camden passed an ordinance requiring a $10,000 annual license fee from every store wherein groceries "are exposed for sale on shelves, stands, platforms, or counters, or in bins or aisleways in such a manner that the purchasers are permitted to make a personal selection."

Two Means to the Same End

WASHINGTON AND OREGON this year produced a surplus pack of prunes. The Federal Surplus Commodities Corporation is preparing to purchase the surplus for distribution through state relief agencies to needy people. Purchases are to be made from handlers, who buy equivalent quantities of natural condition prunes from growers at a minimum price of ¾ths of one cent less per pound than the price at which the corporation purchases from packers. The corporation will purchase both French type and Italian type dried prunes, including the hold-over from the 1936 crop. That is one way of removing the surplus dried prunes from the market.

The A. B. & C. Packing Corp., Vancouver, Wash., started canning dried prunes processed, ready for the table, in 1936. The canned product in processed form is suitable as stewed prunes for a breakfast dish, as a salad, dessert, prune whip, etc. Sales, the first six months of 1937, increased 200 per cent over 1936 sales. Sales, the second six months of 1937, increased 600 per cent over sales the first six months of 1937. Sales, the first three months of 1938 have more than doubled 1937 sales.

This is another way in which surplus stock can be reduced. Unquestionably, the latter method would be the choice of those engaged in manufacturing foods, probably also the choice of the growers, because the latter method is not just a shot in the arm but a permanent method of reducing surpluses.

New

Novel Related Item Package

THE "KATE SMITH'S BAKE-A-CAKE Kit," product of General Foods, New York, not only offers the housewife a group of four related items, but also the utensils for making the prepared foods from the related item ingredients. The assortment contains an 8-oz. package of flour, 4-oz. can of baking powder, ⅛ lb. can of coconut and a 3-oz. package of chocolate. These, inclosed in two cake pans are packaged as a unit. Booklets inclosed in the kit furnish recipes for many dishes to be made from the ingredients. The cardboard container for the kit, which retails at 31 cents, carries recipes for making several kinds of cake from the ingredients in the kit. This combination package is interesting because it offers a group of related items in small quantities, with recipe enclosures, at an attractive price. A desirable and related premium is included as an extra inducement. Because of the novelty of the kit and the fact that it capitalizes on a popular radio program, the kit commands window, counter and other display in the retail outlet.

Fruit Drink from Papaya

THE PAPAYA, tropical melon-like fruit, known for its benefits to digestion, comes to this country as a fruit drink, "Haley's Papaya Nectar," a ready-to-serve drink, is the product of Hawaiian Avocado Co., Ltd., Honolulu, Hawaii.

Canned Grape Juice

GRAPE JUICE, following in the footsteps of beer and ginger ale has recently made an appearance on the market in a

metal can. "Westfield Maid" a grape juice made from Concord grapes, product of Westfield Planters Cooperative Fruit Products Co., Westfield, N.Y., is offered to the trade at prices below the prices of the same juice in bottles.

Paper Tea Balls

HOUSEWIVES on the Eastern Seaboard are being introduced to a new kind of tea ball. "Tenderleaf" tea, product of Standard Brands, New York, is now being distributed throughout a limited territory as tea balls in paper sacks instead of the familiar cloth bags. The odorless, tasteless cooking parchment which contains the tea leaves is perforated with numerous vents which permit the boiling water to permeate and extract the herb flavoring from the tea leaves. The new tea balls are packed 8, 20 and 100 count to the carton.

Insured Package

THE NEW CHOCOLATE COOKIES of Beech-Nut Packing Corp., Canajo-

PACKAGES AND PRODUCTS

harie, N.Y., are well insured against breakage and spoilage from moisture. The merit of these chocolate cookies depends in no small part on their crispness and crunchy quality. Each group of five cookies is protected by a crimped edge paper cup. These are protected, top, bottom and sides, by corrugated paper surounded by a paperboard container. These precautions insure the cookies against breakage. Outside the paperboard container are two separate heat-sealed wrappings of waxed paper separately applied.

Basket Promotes Spice Sales

IT IS AT BEST difficult in this country to promote the sale of spices and condiments where the taste for delicate or highly flavored foods is less developed than in other parts of the world and where the true gourmet is as rare as a museum specimen. John Wagner & Sons, Philadelphia, have successfully promoted the sale of a wide variety of imported spices, flavorings and condiments through the use of noved wicker baskets. The baskets, containing a variety of from four to nine condiments, are suitable for table as well as for the kitchen use. Distributors throughout the country sell the baskets either packed as a composite item or separately to be filled with spices and condiments at the choice of the purchaser.

Recipes Label

"SPAM," new meat product of Hormel Co., Austin, Minn., comes to the market with a label bearing illustrated recipes for "101 Uses." This new label satisfies the requests of consumer organizations voiced recently through their platform speakers. "Tell us not only what the product is, but also how to use it."

Prepared Fudge Cake Icing

FROM THE WEST COAST comes a product new to the Central States and as yet not in distribution on the East Coast, "Quick Fudge," product of Golden Nugget Sweets, Ltd., San Francisco. The product is a prepared mix suitable for making fudge as well as chocolate cake icing. It requires but three to four minutes heating. This product should find a ready market with busy housewives.

New Member of Juice Family

"CAROTENE VITAMIN A," the youngest member of Los Angeles' Hansen's Fruit & Vegetable Juice Co., is now being delivered to consumers along with the morning milk. The delivery service for these fruit and vegetable juices, which includes the juices of celery, beets, spinach, parsley, rhubarb, and coconut is available to hospitals and offices as well as to the home.

New DISCOVERIES AND INVENTIONS

FOOD ENGINEERING

How to Test Filter Material

AN INTERESTING experimental filter press for the evaluation of filtering materials consists of a small vertical cylinder in which the test material is held between two grooved plates. The material, in paste form, is pressed into a cake, and the fluid is then forced through the cake. Four factors are used to measure the efficiency of the material: the number of living organisms which pass through the filter; reduction in turbidity; stability at 25 deg. C.; and rate of filtration.

Digest from J. Raux. Brasseur Francais 1, 77, 1937 (Published in France.)

Gaskets for "Sanitary" Cans

RUBBER COMPOSITION GASKETS for sealing "sanitary" cans must meet exacting requirements, imparting no color, flavor or odor to the can contents and coming unharmed through the sterilizing process. The composition must be distinctly but not highly elastic, with considerable plasticity and no brittleness. It must be oilproof, at least at room temperature. Rubber is not itself oilproof, but actual experience has shown that a sardine can, properly sealed with a correctly compounded unvulcanized rubber gasket, keeps well with practically no change in the gasket. Protection from air is essential for such a result. For many years past, in Europe, sardines in oil have been successfully packed in grooved cans sealed with unvulcanized rubber-balata gaskets.

Toxic ingredients must be scrupulously avoided in compounding gaskets for food tins. Barium sulphate, a common filler for rubber, is sometimes contaminated with lead compounds. For this and other possible hazards the ingredients of can-gaskets must be analyzed before use. In modern practice, gaskets made from rubber latex pastes are actively competing with the older types of compounded rubber. In drawing up specifications there is considerable disagreement, for example, in tolerances for ash and specific gravity. Some makers urge wide limits, to permit choice of fillers, contending that a light, nearly ashless filler like carbon black should not be barred merely because of a minimum ash or specific gravity requirement. On the other hand, narrow tolerances have their defenders, striving for strict quality control. In the matter of resistance to fruit acids, and other substances coming in contact with gaskets, there is closer agreement.

Digest from "Seals for Grooved Cans," by Werner Esch, *Chemiker-Zeitung* 61, 981, 1937. (Published in Germany.)

FROZEN FOODS

Frozen Meat Storage

CHILLING MEAT without freezing it has the advantage over curing, pickling and canning in that it causes no physical or chemical changes, but its preservative effect is relatively short in duration. Freezing changes both the distribution and the state of the water naturally contained in the meat, but does not introduce foreign substances (as in pickling, curing or smoking) nor cause such chemical and physical changes as occur in canning. The changes caused by freezing are partly reversible, since the protein which gives up its water at freezing temperatures absorbs the water again when it melts. Hence proper thawing restores frozen meat very nearly to its original fresh state. The most important precaution is to thaw the meat *before* cutting it, so that the fibers can take up the water again.

Quality of meat is an important matter in successful preservation by freezing, and some factors call for special care even in raising the animals before slaughter. Proper care and handling before and after slaughter are important for obtaining sound, clean meat of the best texture and quality. An outer layer of fat is the best natural protection against excessive drying and spoilage by molds or bacteria.

Pork is much more sensitive to conditions than beef, and accordingly requires greater care. The common belief that a temperature of —6 deg. C. (21 deg. F.) is sufficiently low is misleading because it is true only to a limited extent. Lower temperatures are needed for long storage and for special cases but, of course, needlessly low temperatures are to be avoided in the interests of economy.

Digest from "Preserving Meat by Freezing," by E. Kallert, *Vorratspflege und Lebensmittelforschung* 1, 20, 1938 (Published in Germany).

METHODS OF PRESERVATION

Gas Storage of Pears

BARTLETT PEARS held at 45 deg. F. for twenty days in 20 per cent carbon dioxide, or for 30 days in 35 per cent carbon dioxide have approximately the same merchantable life as the same fruit stored in air at 32 deg. F. immediately after harvest. Gas stored fruit may be later stored in air at 32 deg. F. and ripened at 65 deg. F. with normal results.

Digest from "Effect of Carbon Dioxide Storage on Bartlett Pears under Simulated Transit Conditions," by Gerhardt and Ezell. Journal of Agricultural Research, 56, 121, 1938.

Diseases of Lemons in Storage

AS A RESULT of commercial experience, lemons are usually stored and shipped at temperatures of 50 deg. F. or over and in atmospheres where the carbon dioxide content is held to a maximum of 0.5 per cent. In their journey from grove to consumer they are subject to many diseases, the frequency and intensity of which may or may not be affected by these factors.

Decay, whether the black rot caused by an *Alternaria*, or from *Penicillium* molds, is less at 32-36 deg. F. than at higher temperatures for the first six or eight weeks of storage, but may be greater after storage for ten weeks or more. Neither the presence of carbon dioxide or waxing the fruit has any effect on this type of decay.

Pitting of the rind, and peteca (a variety of pitting), are of no importance in storage at 50-60 deg. F., but increase markedly as the temperature decreases, being especially bad at 32 deg. F. Holding the lemons in 30 to 50 per cent carbon dioxide for two or three days before storing sometimes helps to prevent pitting. Otherwise this gas has no definite effect. The use of oiled wrappers or waxing the fruit is helpful against this defect. Red blotch was not common enough in these

experiments for any conclusions to be drawn.

The commonest trouble was membranous stain, a darkening of the membrane between the segments, visible only when the lemon is cut. This is extremely bad in storage at 40 deg. F., from 75 to 100 per cent of the lemons being affected. It is less severe at 36 or 50 deg. F., mild at 60 deg. F., and very slight at 32 deg. F. Increasing the carbon dioxide in storage, waxing the fruit, or the use of oiled wrappers, all tend to prevent the disease.

A watery break-down, resembling frozen fruit, sometimes associated with "scald," results from long storage at low temperatures and is increased by carbon dioxide treatment. Internal decline, a drying out of the internal tissue, is not affected by storage conditions. Carbon dioxide treatments or waxing delay color-development and the latter also helps to maintain firmness. This last quality decreases as the storage temperature increases.

Digest from "Some Effects of Storage Conditions on Certain Diseases of Lemons," by Charles Brooks and Lacy P. McColloch, *Journal of Agricultural Research*, 55, 795, 1937.

VITAMINS

Vitamin E

IN THE STUDY of vitamin E from wheat germ oil, a new compound has been isolated which is closely related to vitamin E, both chemically and physiologically, but is not identical. Since the vitamin is known chemically as alpha-tocopherol its new relative has been named neotocopherol. Its vitamin-E action, as tested by the biological assay method, is distinct but is weaker than that of the true vitamin. The minimum effective dose (rat tests) is 2 or 3 mg. of alpha-tocopherol, whereas at least 8 mg. of neotocopherol is required to show a perceptible effect. There is chemical evidence to indicate that the tocopherols are derived from durohydroquinone and a long paraffinic side chain which is joined to the durohydroquinone molecule both through the oxygen atom and through a carbon atom.

There is also some evidence, still awaiting confirmation, that the paraffinic side chain is composed of four isoprene units, joined end to end. The isoprene molecule is much used in nature as a structural unit (rubber is one of the most conspicuous examples) and so the tocopherols are related in this respect to many compounds synthesized by nature in living plants. This gives them a theoretical interest while their practical importance resides in their vitamin potency.

Digest from "A Study of Vitamin E," by P. Karrer, H. Salomon and H. Fritzsche, *Helvetica Chimica Acta* 21, 309, 1938. (Published in Switzerland).

BAKERY PRODUCTS

Effect of Formula And Procedure Variation Upon Cake Quality

CAKE-BAKING LABORATORY FORMULAS are elastic within certain definite limits beyond which the resulting cake quality ceases to be acceptable. In a series of bakings, the sugar, fat and liquid were varied 25 per cent, and the baking powder 50 per cent, above and below the control point. The procedure—mixing time, quantity of batter and baking temperature—were kept constant in this series.

Coarse grain, large volume and flat contour of crust were observed in those cakes in which the sugar was increased. The same results were noted in the cakes in which the baking powder was increased, and likewise in those in which the liquid was decreased. The cakes with increased baking powder were also more tender.

The effects of procedure variables were then determined by keeping constant the standard laboratory formula and varying the procedure factors. These vary as follows: mixing time from 3 to 9 minutes, quantity of batter from 250 to 350 grams, baking temperature from 325 to 425 deg. F. In each of those cases, it was found that the median value of each procedure factor gave the best results.

Digest from "The Effect of Formula and Procedure Variables upon Cake Quality," by John R. Davies, *Cereal Chemistry*, 14, 819, 1937.

BEVERAGES

Butyleneglycol In Wines

EXAMINATION of twenty samples of different types of wine for butyleneglycol and its immediate oxidation products (acetylmethylcarbinol and diacetyl) revealed none whatever of the two oxidation products, but did show the presence of small amounts of butyleneglycol. In dry wines and unfortified sweet wines each liter contained 38-72 mg. (0.63-1.2 grains) butyleneglycol for each vol.—per cent of alcohol. Fortified sweet wines (port, Geropiga, Tarragona, Malaga) contained only 3-15 mg. (0.05-0.25 grain) for each vol.—per cent of alcohol. Some samples, evidently fortified before the fermentation, were found to contain no butyleneglycol at all.

The presence or absence of butyleneglycol in a wine, and its amount when present, will not alone suffice for making distinctions between different types of wine, but will give helpful information when taken in conjunction with other evidence. In particular, the relation of fructose to total sugar content, and the hydroxymethylfurfural content, when considered in connection with the butyleneglycol content of a wine, give sufficient information for making definite distinctions between wine types in many cases.

Digest from "Determining Butyleneglycol, Acetylmethylcarbinol and Diacetyl in Wine," by L. C. E. Kniphorst and C. I. Kruisheer, *Zeitschrfit fur Untersuchung der Lebensmittel* 74, 477, 1937. (Published in Germany.)

Ultraviolet Water Sterilization

IN A TEST of a new type of ultraviolet ray lamp suspended in a vertical bronze tube, water was sterilized at the rate of 660 gal. per hour while using 700 watts of electricity. The temperature rise was 0.2 deg. C. Raw water enters at one side of the bottom of the tube, ascends spirally in contact with the lamp.

Digest from *Brewing Trade Review*, 51, 403, 1937 (Published in England).

CANNED AND PRESERVED FOODS

Lactic Acid for Pickling

GOOD COMBINATIONS of lactic and acetic acids for preserving pickles are 0.6 and 1.4; 0.4 and 1.2; 0.2 and 1.8 per cent respectively. Any of the foregoing combinations is satisfactory from the viewpoint of keeping quality and flavor. In fact, the flavor of pickles preserved in a combination of these acids is superior to pickles preserved in either acid alone.

Digest from "The Use of Lactic Acid in Preserving Pickles," by F. W. Fabian. *Conference on Pickling*, Mich. State College, Feb. 23–25, 1938.

How to Preserve Fermenting Brines For Chemical Analysis

BECAUSE actively fermenting brine may change considerably between the time of taking a sample and laboratory analysis, it is necessary to add a suitable preservative to stop the changes. Otherwise the laboratory will be analysing something quite different from the original sample.

Satisfactory preservatives for this purpose are:

Chloroform, 1 part to 100 parts brine, for samples for titrable acidity

and pH, but not for reducing sugar determinations.

Dowicide B (Sodium 2, 4, 5 trichlorphenolate), 1 part to 10,000 parts brine for titrable acidity, pH and also for reducing sugar determinations.

Either of them will "keep" tightly sealed samples of actively fermenting brine for six months.

Digest from "The Preservation of Brine Samples for Chemical Analysis," by M. K. Veldhuis. *Conference on Pickling*, Mich. State College, Feb. 23–25, 1938.

DAIRY PRODUCTS

How to Measure the Extent of Freezing in Ice Cream

BY THE USE of an instrument, known as a dilatometer, the extent of freezing of water in ice cream or other mixtures can be measured. The instrument measures accurately the expansion of the small sample under test, and by suitable computation this expansion can be converted into percentage of ice formed. The method, though accurate is slow: 7-10 days of work being required to test any sample from —2 deg. C. to —25 deg. C. Research workers will find a new table of theoretically calculated changes in volume accompanying the freezing of a 20-per cent sucrose solution, which is an extension of the data given in International Critical Tables.

The value of the work lies in its application to design and operation of ice cream freezers and subsequent hardening operations.

Digest from "Uses of the Dilatometer in Measuring the Extent of Freezing in Ice Cream and Related Products," by W. C. Cole, Journal of Agricultural Research, 56, 137, 1938.

FATS AND OILS

Extracting Fats to Lower the Acid Number

AN IMPROVEMENT in the art of refining oils, fats and waxes by solvent extraction is disclosed in French Patent 822,176 (granted Dec. 22, 1937, to N. V. de Bataafsche Petroleum Maatschappij, The Hague, Holland). The invention is based on the observation that amines which do not contain a hydroxyl group but which are easily hydrated are exceptionally potent as selective solvents for purifying fatty substances. There are numerous amines which meet the requirements, ranging from such simple compounds as ethyl- and isopropylamine through diethylamine and trimethylamine to more complicated structures such as cadaverine, piperazine and diethylenetriamine. The selected amine is employed in the form of its hydrate.

A particular merit of these solvents is that they act as fixatives for free fatty acids, thus greatly lowering the acid number of fats contaminated with free acids. For example, 125 parts of cocoa butter with acid number 7.8 may be shaken 20 minutes at 60 deg. C. (140 deg. F.) with 6 parts of ethylenediamine monohydrate, then centrifuged. The acid number of the treated fat is only 0.11. Again, 125 parts of palm oil, acid number 10.3, may be shaken at 40 deg. C. (104 deg. F.) with 15 parts of a saturated solution of trimethylamine in water. The acid number of the extracted oil is only 0.43. The method may also be applied to numerous other fats and oils, especially for removal of acidic impurities.

FLOUR AND GRAIN PRODUCTS

Better Storage of Grain

ONLY SOUND GRAIN should be stored, and soundness can be estimated by testing germination activity. Grain which has lost as much as half of its initial germination activity is unfit for storage. The moisture content must not be over 14 per cent, and in many cases artificial drying is needed.

A cause of spoilage which must be guarded against with particular care is moisture condensation on bin walls in cold weather. This occurs most easily in metal bins when the cold outside air chills the inside air, next to the metal wall, below the dew point. The condensed water wets the grain next to the wall, and spoilage sets in. The same thing happens, though not so easily, in concrete bins. Heat insulated (double walled) bins are needed where this hazard exists.

Another danger is bacterial spoilage. Cleanliness is the best preventive in this case because dust and dirt carry the attacking bacteria. Grain which is chilled in winter and stored in heat-insulated (double walled) bins will remain cold all summer, thus preventing growth of weevils and other pests. But such cold storage must be under conditions which will not permit moisture condensation. Artificial refrigeration may also be employed, but the cost is much greater than for winter chilling. Because of their much greater temperature stability, concrete bins are better than iron or steel bins, in spite of their higher first cost.

Digest from "Conserving Grain Supplies," by K. Mohs, *Vorratspflege und Lebensmittelforschung* 1, 12, 1938 (Published in Germany).

MEAT PRODUCTS

Lactic Acid Used For Curing Pork

AN IMPROVED TREATMENT for curing or pickling pork, either by brine immersion, brine injection or dry salting, utilizes lactic acid as an aid to the "spices." As disclosed in British Patent 474,905 (granted Dec. 9, 1937 to Hans J. Jerne of Wassenaar, Netherlands) a suitable pickle composition comprises approximately 158 gal. water, 330 lb. salt, 33 lb. saltpeter, 33 lb. sugar, 33 lb. of any suitable preservative and about ½ lb. lactic acid. The saltpeter may be used in smaller proportion, or omitted entirely, if desired. In general, the proportion of lactic acid should be about 0.1 per cent, calculated either on the salt alone or on the total of dry ingredients. Of the two available lactic acids, namely sarcolactic acid from meat and ordinary lactic acid from milk, it is somewhat preferable to use sarcolactic acid. It is well to carry on the curing operation in the cold, for example at 10 deg. C. (50 deg. F.).

MISCELLANEOUS

Dewatering Yeast

FRESHLY PREPARED YEAST is dewatered in two stages, according to an invention of Eduard Farbar, Heidelberg, covered by German Patent 655,337 (granted Jan. 13, 1938, jointly to Holzhydrolyse Aktiengesellschaft, Heidelberg, and N. V. Internationale Suiker en Alcohol Co. "Isaco", The Hague). The first stage consists in centrifuging the yeast fresh from the fermenter. It may also be pressed if desired. After this preliminary dewatering operation, the wet yeast is stirred with a concentrated sugar solution, which absorbs water from the yeast and is thereby diluted. Then the dilute sugar solution is separated from the yeast before any fermentation of the sugar can occur. The concentrated sugar solution may contain nutrients such as ammonium sulphate, sodium phosphate or acid ammonium phosphate. Its amount may be adjusted in such a way that, when the diluted solution is used again, the amount of new yeast produced from it will not be greater than would correspond to the yeast already dewatered by the solution. The invention is also covered by British Patent 476,545 (granted Jan. 6, 1938) and Italian Patent 352,465 (application filed June 16, 1937).

The PLANT NOTEBOOK

Transferring Oil from Drums to Kettles

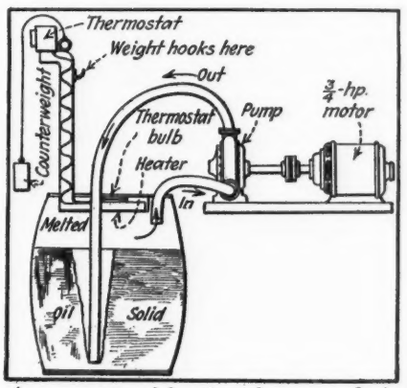
We have been transferring coconut oil from drums into kettles by the time-honored method of using a dipper or a bucket. However, this involved the use of considerable labor, and besides the slop and consequent dirtiness of the method, also involved the loss of considerable oil over a period of several weeks or a month. Several plans were considered for getting around this, all the way from hoisting the individual drums over the kettles and tipping them on an overhead railway, to the use of a portable pump. It was finally solved in the following manner:

A stand was built, 34 in. high, with casters on two corners and a handle on the other side much in the manner of a tea wagon. The top of this platform was of such a size that it could hold the base of a combined motor and rotary pump. At first, we used a ½ in. rotary pump with bronze gears hooked up to a ½ hp. motor. This worked so well that we sent it to our New York plant, which has a smaller capacity than ours.

We have since built ourselves a ¾ in. size which is doing fine work. Besides emptying the tanks, this pump also has another use. In the winter time, quite frequently oil comes to us in a frozen condition. In order to break this down, we purchased a 5 kw. Chromalox heater which has a circular section and will just fit into a drum. This is counterbalanced very nicely so that it will stay in any position desired. As a safety measure, it also has a thermostat set for 520 deg. F., so that in case some one leaves the switch closed while not in use, the thermostat will shut off the element before any damage is done.

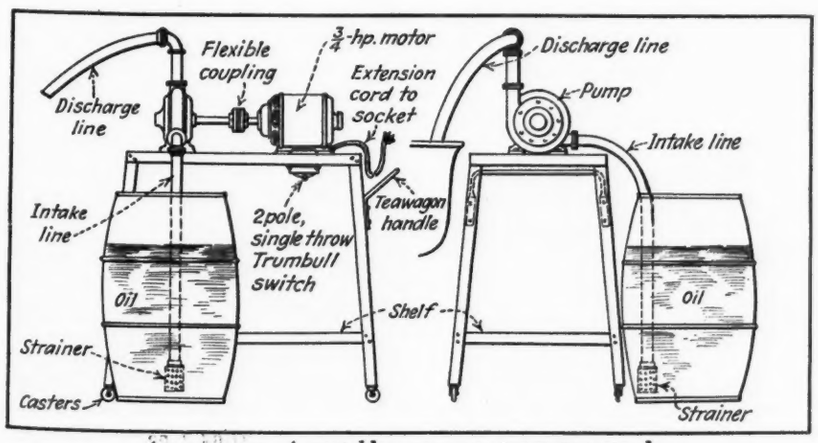
In melting oil, the heating element is put on top of the drum of oil and a 10 lb. weight hung on the upper end so that it will gradually sink as it melts its way through. We found, however, that there was one disadvantage. Due to the relative low thermal-conductivity of oil, the top of the drum would become quite hot, in fact, would boil and scorch and the bottom would not even be warm. We solved this difficulty as follows:

The pump was brought alongside of the drum. From the inlet side of the pump, a short pipe was installed to take hot oil from the top of the oil directly over the element. On the outlet side of the pump, a longer piece of pipe was used and a hole was drilled through the oil as far as possible using the pipe as a drill. This longer pipe was then hooked up to the discharge side of the pump. The pump started and the hot oil in circulating from the bottom to the top was heated, hot oil taken to the bottom and in this way a



Arrangement of heating element and circulating pump for melting coconut oil.

drum of about 500 lb. could be broken down sufficiently to be handled within a half hour. At the current commercial power rate, it cost us about 10 cents to meld a drum of oil and pump it into a kettle by this procedure as against about an hour's labor digging it out with knives, shovels, picks, or what have you.—W. G. WOLFE, *Downers Grove, Ill.*



Arrangement of portable pump on tea-wagon stand.

Intelligent Choice of Reducing Value

Industrial plants engaged in the processing of food products often use a considerable amount of steam at other than boiler pressure. In order to supply this at the right pressure, reducing valves and similar controlling devices are installed. When the necessity for installing such a device arises, the first question is, what size should it be. This would appear to be an easy question to answer, but unfortunately, in practice, the problem is not quite as simple as it seems.

The object of reducing, and similar control valves, is generally to reduce the steam to a pressure lower than that at which it was supplied and to hold this pressure constant under all loads. In practically every case this is done by introducing a resistance to the flow of steam, thus producing a drop of pressure through throttling.

This being the case, it is obvious that the passage for the flow of steam through the valve must be considerably smaller than that of the unrestricted steam main. The question then is, how much less, and what commercial size of valve will give the desired result.

One may perhaps say that it will be all right to install a valve of the same size as the pipe, and rely upon the automatic partial closing of the valve to take care of conditions. This can be, and often is, done. The objections to it are, however, serious.

In the first place, the larger valve is unnecessarily costly. But more important still is the fact that for a considerable part of the time, the valve disks will be only slightly lifted from the seats, producing poor regulation, wire drawing and scoring of the disks and seats. The best practice requires that the valve should operate as nearly as possible fully open when carrying the maximum load, so that the disks will be lifted a reasonable distance off the seats even at a much lighter load.

Unfortunately, although there is, of course, a certain rough relationship between the capacities of different makes of valves of the same nominal size, there is no definite fixed relationship which can be relied upon if we want to get the best results. Some manufacturers issue very reliable data based upon tests which give the actual capacities of their valves under different operating conditions. Others furnish data which are evidently based upon the application of some standard formula, such as Napier's, to an orifice having the same area as their valve when fully open. This affords a rough guide, but investigations have shown that, as might reasonably be expected, a reducing valve does not provide an accurate metering orifice, and its action conforms only approximately to the laws governing the operation of such orifices.

In spite of inherent weaknesses, information obtained in this way will often enable us to obtain a suitable size of valve. Or if information can be had as to the size of orifice to which the valve opening is equivalent, we can apply Napier's formula, and obtain a reasonable idea as to the capacity of the valve.

It should be kept in mind that the orifice size and the nominal valve size are seldom, if ever, the same and valves of the same nominal size, but different makes, generally have different orifice equivalents.

Napier's formula is as follows: $W=Ap/70$, in which A is the orifice area in square inches, p, the reservoir (high pressure pipe) pressure in pounds per square inch and W, the weight of steam in pounds flowing per second when the pressure on the discharge side is approximately 0.6 or less of the high pressure, p.

Tests have shown that, as a rule, with reducing valves the maximum flow occurs when the discharge pressure is less than 50 per cent instead of 60 per cent of p.

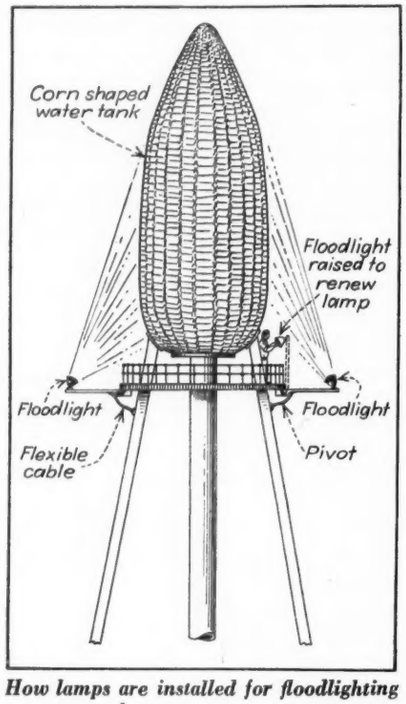
It will be seen from the above that it is important to obtain the most reliable information as to the operating characteristics of any make of valve which it has been decided to use. Too often the data provided by salesmen and others are far from accurate, and tables are in use which are supposed to apply to all makes of valves but which in all probability do not rightfully apply to any.

In the absence of more reliable information, it is safe to say that, as a rule, a valve of half the nominal size of the supply line will have ample capacity to take care of any probable load.

It is always well to keep in mind the fact that a double-seated valve cannot be expected to shut off absolutely tight at no load, as expansion generally makes it impossible for both disks to close accurately together. Where a complete shut off is required, a single-seated valve should be used which, except in the smallest sizes, should be pilot-operated. This adds considerably to the cost, but it is the only way to insure a tight job.—JAMES A. G. GIBBONS, *Bloomfield, N. J.*

Floodlighting Water Tanks

The increasing utilization of elevated fire and service water tanks as an advertising medium brings up the problem of effective lighting. Floodlights placed at the ground level or on the roofs of adjacent buildings,



How lamps are installed for floodlighting a water tank.

while commonly used, consume an excessive quantity of electricity in projecting the required light over the distances involved. With tanks designed to resemble a principal product of the plant a high degree of illumination is necessary if they are to be outlined advantageously and any method of increasing the efficiency of floodlighting will usually result in substantial money savings in the cost of power for lighting.

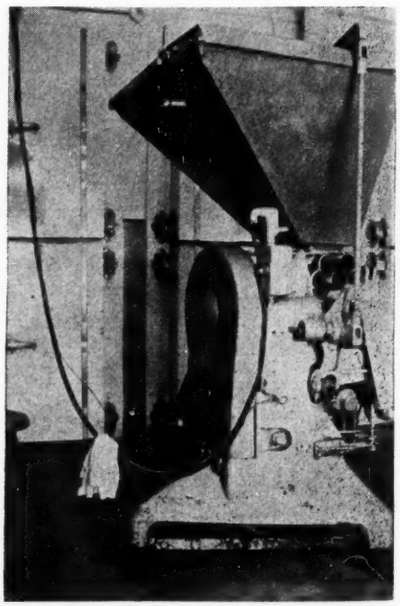
A large Midwestern food processing plant having an elevated tank shaped and painted to resemble a mammoth ear of corn secures adequate illumination with minimum current consumption by placing floodlights directly under the surface to be lighted. As shown in the sketch the projectors are attached to structural steel arms extending out from the working platform at the base of the tank. These arms are pivoted so that lamps can be renewed without leaving the platform. Current is supplied through flexible armored cable and is turned on and off by a time switch thus eliminating any waste that might be caused by failure to turn off the current.

This method of lighting in addition to reducing current bills does not show up the tank supporting structure and when viewed from a distance at night the only impression gained is that of an ear of corn or any other desired shape suspended in the sky.—S. H. COLEMAN, *Roanoke, Va.*

Steel Cable Saves Electrical Hook-Up

Rough handling will not damage the electrical cable on the machine shown in the accompanying photograph. This is a one-ton machine, mounted on casters, and when it is moved it is held in tow by a ¼-in. steel cable, which "chums" the electric conductor. One end of this steel cable is fastened in a hole in a ceiling I-beam, while the other end is securely bolted to the machine near the terminal box.

Slack is left in the power cable at each end while in between it is taped to the steel cable. This makes the steel cable take the shock if the machine lunges while being moved, thus protecting the power cable from damage. It is also a safety feature if the operator slips on the floor when moving the machine.—BILLIE BURGAN, *San Diego, Calif.*



Method of protecting a power cable with a steel "chum" cable

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

New Valves and Fittings

CRANE Co., 836 So. Michigan Ave., Chicago, Ill., has recently announced several new products, as follows:

A line of brass screwed end globe and check valves for 350 lb. steam pressure at 550 deg. F. temperature, which can also be used on non-shock cold water, oil or gas lines up to 1,000 lb. pressure, and which come in sizes from ¼ to 2 in.;

A line of brass globe and angle valves with plug-type disks, for severe service on lines carrying steam, hot water, cold water and oil, for 150 lb. steam pressure or 300 lb. cold water pressure, in sizes from ⅛ to 3 in.;

A line of iron body globe and angle valves with plug-type disks designed to withstand exceptionally severe service, for 150 lb. steam pressure or 300 lb. cold water or oil pressure, in sizes from ¼ to 3 in.;

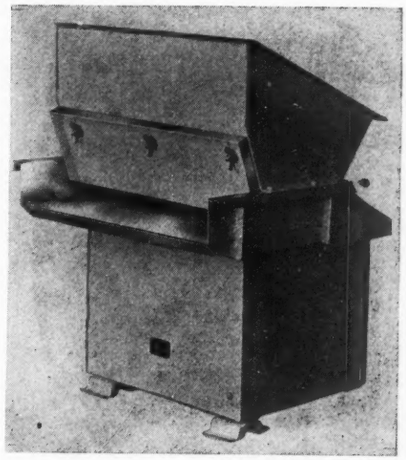
A line of brass fittings for flared copper tubing, including elbows (90 and 45 degree), tees, couplings, reducers and adapters, in sizes from ⅜ to 1¼ in., rated at 175 lb. water working pressure.

Moisture Proof Wrapper

GOODYEAR TIRE & RUBBER Co., Akron, Ohio, has applied its rubber derivative "Pliolite" to various types of wrapping paper in order to render them proof to moisture and vapors. The material is a light amber resin which is applied to the paper as a coating. It can be made to heat seal, or not, as desired. It is applied to glassines or other popular wrappings and when used for wrapping foods it is tasteless, odorless, and imparts a high gloss to the paper. The makers cite tests showing that the use of this coating reduces moisture transfer of glassine paper to 0.4 per cent of the transfer found with the uncoated material.

Vibrating Feeder for Belts

SYNTRON Co., Homer City, Pa., is making a vibratory feeder for feeding nuts, candy pieces, vegetables such as peas, and other small objects onto belt conveyors for inspection or sorting.



Belt feeder of vibrating type.

This feeder has a wide trough of short length, and a receiving hopper with an adjustable gate. Movement of the material in a wide, single layer is effected by vibration. This spreads it on the belt in an evenly spaced manner, ready for inspection.

Control is by rheostat in a separate, wall-mounted controller. Current is 110 volt a.c.

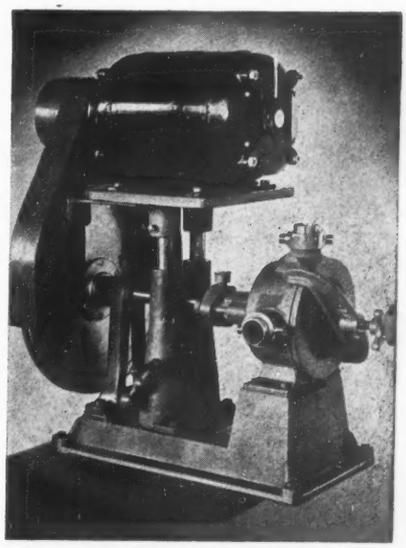
Photoelectric Control

PHOTOSWITCH, INC., 21 Chestnut St., Cambridge, Mass., is making a line of photoelectric controls for industrial use. These switches are said to be simple and strong in construction and efficient in operation. Model A-10 is supplied for most industrial applications. It operates in 1/30 of a second, from any 115 volt a.c. or d.c. source. Model A-20 is designed for long distance signal systems and controls. There is also Model C-30, combining a photoelectric control and an electric counter.

Pumping Unit

VIKING PUMP Co. has introduced a variable speed, variable capacity pumping unit. Built especially for milk and other food plants, it is available in both standard and sanitary models. The unit is mounted on a flat belt drive base. By turning a handwheel, the motor base plate is raised or lowered. This serves to increase or decrease the pitch of the V-belt motor pulley by contracting or expanding the side walls of the pulley, changing the motor speed and the pump capacity.

The speed range, using a 1,800 r.p.m. motor, is from 200 to 500 r.p.m. With the sanitary pump unit having a capacity of 35 gal. per minute at 450 r.p.m., the capacity range is 17 to 42 gal. per minute.



Variable speed and capacity pump.

This pumping unit is available in the "J" and "K" size pumps using the single belt variable speed unit and a 1 hp. motor; also in the "KK" standard and "L" sizes with a 2 hp. motor and a 2-belt speed unit. Portable units equipped with castors are available if desired.

New Wrapping Paper

H. P. SMITH PAPER Co., 1130 W. 37th St., Chicago, Ill., recently placed on the market a wrapping paper said to be both absorbent and tough when wet. It is claimed that this paper can be washed with soap and water, or boiled

in water, after which it does not disintegrate.

This sheet, which is not high in cost, has already found application in the meat industry, for wrapping fresh cuts. Other uses are expected to develop in markets where its unusual properties are advantageous.

Viscous Liquid Pumps

A LINE OF ROTARY PUMPS for handling viscous liquids such as syrups and oils has been developed by Worthington Pump and Machinery Corp., Harrison, N. J. These pumps come in capacities up to 700 gal. per minute, for pressures up to 150 lb. per sq.in., and for viscosities up to 500,000 SSU or 110,000 centipoises. They are supplied in iron, bronze, Monel, nickel, Everdur, stainless steel, aluminum, or other metals, as needed.

Alloy For Food Equipment

METALLIC CONTAMINATION of food products is said to be avoided for all practical purposes through the use of a metallic alloy, "Oldsmoloy," in the construction of equipment with which the food material comes into contact. This alloy is a product of Olds Alloys, 115 East Glenarm St., Pasadena, Calif. It has a tensile strength of 70,000 to 76,000 lb. per sq.in. Elongation in 2 in. is from 15 to 20 per cent. Reduction in area is 21.7 per cent. Hardness is: Scleroscope, 35; Brinnell, 135. Melting point is 2,200 deg. F. Proportional elastic limit with Berry strain gage equals 25,150 lb. in.^{2} Modulus of elasticity is 15.3×10^6 lb. per in.^{2} Composition: Copper, 44; zinc, 38; nickel, 14; tin, 1.50; molybdenum, 1.50; manganese, 0.50; aluminum, 0.25; chromium 0.10.

The alloy is at present available only in the form of castings. One great advantage claimed is that sound, strong, thin-walled castings can be made, thus saving either much weight or else considerable machining.

According to the manufacturer of this alloy, test shows unusual resistance to both hot and cold food acids, such as citric, acetic and lactic acids. It is also said to have shown great resistance to sterilizing solutions such as are used to clean milk products equipment. Resistance to brines and alkalies is also said to be high.

The metal takes a high polish and retains its lustre. It is non-magnetic and non-carbonizing. It welds readily by the oxy-acetylene method, special welding rod being available. Finally, it is claimed that bearings of this metal can be safely run without lubrication, as the metal is self-lubricating, a feature of interest where lubricants would contaminate the food being processed.

Shipping Pail Closure

WILSON & BENNETT MFG. CO., 6532 So. Menard Ave., Chicago, Ill., is making an "E-Z Seal" outside locking lever closure for its line of steel pails. This closure fits the standard pails produced by this company.

Shipping pail closure.

The closure, as shown in the illustration, has the closing lever on the outside of the pail and tightens the ring around the pail by a direct pull. When the lever is released, the ring springs open and drops down around the outside of the pail.

Pure Steam Treatment

CLEAN STEAM, scale prevention and avoidance of damage to boilers can, in most cases, be obtained only through the use of some treatment or modification of boiler feed water. In general, these measures involve either a chemical or physical action. In the latter class are the colloidal compounds added to boiler water. A new compound of the colloidal type, recently introduced into the United States is K.A.T., manufactured by American K.A.T. Corporation, 122 East 42d St., New York, N.Y. This product is the invention of Jean de Frank, formerly naval engineer of the Imperial Russian Navy.

K.A.T. contains no oils, and it is claimed that it will not break down under pressure. It is also claimed that the material will not carry over with the steam but, in any case, is innocuous in composition and so can be safely used in any food industry where steam comes into contact with the product. As an indication of this, it is said that, in Latvia, where it was first introduced, over 200 dairies, breweries and textile mills are using this boiler water treatment.

Success of this compound in treating boiler water arises from the fact that the colloids in it form a coating over the impurities so that they are removed without chemical change, and in the form of sediment. Also, the compound coats the boiler metal, protecting it against corrosion.

Vari-Pitch Speed Changer

A SPEED-CHANGING DEVICE of the vari-pitch sheave type has been developed by Allis-Chalmers Mfg. Co., Milwaukee, Wis., to meet the demand for a compact, economical and flexible unit in a great variety of industries. The new product is designated the "Texrope Vari-Pitch Speed Changer."

It consists of a pair of shafts on which are mounted two deep-grooved vari-pitch sheaves adjusted through a worm and worm wheel operated either manually by means of a hand wheel or electrically through a pilot fractional horse power motor controlled. The vari-pitch sheave principle merely consists of a group of movable V-shaped plates mounted on a shaft to permit the V-belt to ride higher or lower in the groove, thus producing a larger or smaller sheave diameter and resulting in a change of speeds.

Seven sizes are available, covering a range from 1 to 33 hp., with a speed range from 3.75 to 1, and running between 300 and 3,600 r.p.m.

Vari-Pitch speed changer applied to machine drive.

News

General News—Business Trends—Men, Jobs and Companies

Fate of Wage Bill Hangs On Possible Filibuster

Opponents of the pending wage-hour legislation are fighting a last-ditch battle. And to the recalcitrant Southern senators, insistent that the measure would deal their industrial constituents a fatal blow, the opponents look with persistent hopes. But proponents of the bill, their ranks swelled amazingly following the election returns from Alabama and Florida, insist that their own path is straight, firm, clear and easy. They point out that factional strife between CIO and AF of L has been laid aside, so far as this legislation was concerned, and that John L. Lewis and William Green have joined to support the bill.

The matter simmers down to the willingness of the Southern opponents in the Senate to start and maintain a last-stand filibuster in the sticky heat of a Washington June and July.

The pending House bill, a flat statutory measure without differentials, is to be administered by the Department of Justice. It provides for a 25-cent wage minimum to be increased 5 cents each year for three years to a minimum of 40 cents per hour in 1940. The hours provisions provide for a 44-hour week to start with, to be stepped down to 40 hours in two years.

More Argentine Meat

Argentina plans to go into the meat-packing business on a larger scale. The program proposed would provide for construction of a large, modern, $10,000,000 plant to be financed by a government loan and to be owned and operated by the semiofficial Corporation of Argentine Meat Producers. Money for the projected plant is to be obtained from profits of the government's exchange control system. The plant is to have a monthly capacity of 66,000 cattle, 50,000 sheep and 15,000 pigs.

Finds New Uses for Whey

Sweetened condensed whey for use in the manufacture of candies and other food products is a development reported by Dr. O. E. Reed, chief of the Bureau of Dairy Industry. Prepared in vacuum pan, the product keeps for months without refrigeration, if placed in sealed containers.

FRED BORRIES

At the recent meeting of Millers' National Federation in St. Louis, he was elected president and chairman of the board of that organization and also of Wheat Flour Institute. Mr. Borries is with Ballard & Ballard, Louisville.

The sweetened condensed whey is easily whipped to a high overrun and has a stability suitable for icings, the Bureau reports. It has also been tested in combination with fruits to make whips or frozen desserts, and the Bureau reports success in tests with several canned products such as soup and a tomato-whey beverage.

Sugar Improves Tomatoes

Small additions of sugar will improve the flavor of many tomato products, particularly canned tomatoes, chili sauce and catsup. That is the belief of Dr. Frank A. Lee, chemist at the New York State Agricultural Experiment Station, Geneva, N. Y., as reported in "Farm Research," a quarterly publication of the station.

Dr. Lee, who is making a study of the factors affecting the flavor and quality of fruit and vegetable products, says: "A suggestion of sweetness in tomatoes and tomato products is preferred by many people, even though they may not actually realize that this is the case."

Court Review Section May Block Food Bill

With Congress nearing the end of this session, food and drug legislation is still a live issue, with a chance of enactment. But the chance is conceded to be slim. The revamped bill may come up for consideration in the House, and the Senate is said to be prepared to go ahead with the bill as soon as it is received from the House. But there is strong opposition to the measure in its new form. Secretary Wallace has declared that because of the provision opening the doors of the courts to injunction proceedings against enforcement of orders issued under the bill, it would be better to operate under the present law. Even staunch backers of the bill in the House admit that there is too much court review in the measure. And a minority report attacked the court review section as utterly destructive, contending that the measure as reported out by the House Interstate and Foreign Commerce Committee is fatally weak in its consumer-protection provisions.

Dairy Bureau Reports Progress on Milk Wool

Work on development of processes for the maintenance of artificial fiber from casein, being carried on by the Bureau of Dairy Industry, is moving forward satisfactorily, say Bureau officials. Some improvement in the strength, elasticity and pliability of the fiber is claimed. New methods for converting the semi-liquid combination into a solid as it comes from the spinnéret are said to be virtually complete. The Bureau claims to have developed plasticizers to give needed pliability, as well as to overcome a tendency of the fiber to become brittle on standing.

The cost of manufacturing the fiber is about the same as that of viscose rayon, the Bureau finds. One pound of casein is needed to make one pound of fiber.

The Italian product falls short of the standards toward which the Bureau is working. It must be mixed with wool or other fiber to give needed strength. It is expected, however, that nearly 100,000,000 lb. will be made in Europe this year.

Preserve Case Decision Has Wide Significance

Of far reaching significance is the decision made by the Federal Circuit Court in Brooklyn in the case of Fresh Grown Preserve Corp. on May 17. This decision, which held that the preserving company was not guilty of the adulteration and misbranding charged by the Food and Drug Administration, followed the revelation of the government's method of determining the amount of fruit present in the preserves and criticism of the accuracy of this method by the technical expert for the defense.

The Food and Drug Administration contended that its analysis showed too small an amount of fruit in the preserves. And at the request of the defense, it was revealed that the amount of fruit present was calculated from chemical data derived from an analysis of the water-soluble ingredients of the preserves. But the expert witness for the defense, Dr. S. L. Blumenthal, contended that the total ingredients and not the water-soluble ingredients should be used in the analysis to give the correct figure as to the amount of fruit present.

In explaining its method of analysis, the prosecution made public the data on the ash content of fruits used in making preserves, this data having been collected over a period of 25 years.

This case has renewed contentions on the part of some preservers and consulting chemists that the government should establish definitions which state the maximum and minimum percentages of ingredients which should be present in preserves. For example, the maximum and minimum percentages of ash and other substances ought to be specified, it is claimed.

Precooling Improved

Development of an improved precooling process for vegetables and fruits is reported by D. F. Fisher, refrigeration specialist for the Department of Agriculture. The procedure is to wash the produce and then place it in flowing water cooled almost to freezing by passing over refrigerated coils. The process obviates the disadvantage of the California method, under which the unwashed product is placed in ice-cooled water. The disadvantage is that the water becomes muddy before a day's precooling work is completed.

Deaeration Process

Satisfactory progress is being made at the Winter Haven citrus laboratory of the Bureau of Chemistry and Soils with a newly developed deaerator for citrus fruit juices. In the new device, the juice enters a vacuum chamber in which there is a revolving pan which permits the juice to escape through small holes in the rim. By this process, the juice particles are broken up, permitting rapid and efficient deaeration. The new machine was developed by George N. Pulley, who has taken out public service patent No. 2,060,242.

A large Florida canner of citrus products has had one of the new machines constructed by American Machinery Corp., at Orlando.

CONVENTIONS

JUNE

6- 7—Associated Grocery Manufacturers of America, the Homestead, Hot Springs, Va.

6–10—Association of Operative Millers, Hotel Nicollet, Minneapolis, Minn.

6–10—National Confectioners' Association, Waldorf-Astoria Hotel, New York.

14–17—American Dairy Science Association, Columbus, Ohio.

19–21—National Macaroni Manufacturers' Asscciation, Edgewater Beach Hotel, Chicago, Ill.

21–24—Food Preservation Conference, Pennsylvania State College, State College, Pa.

23–24—American Fisheries Society, Battery Park Hotel, Asheville, N. C.

27–29—Flavoring Extract Manufacturers Association, Waldorf-Astoria Hotel, New York, N. Y.

JULY

12–14—National Confectionery Salesmen's Association of America, Pittsburgh, Pa.

Sorbose Cost Cut 99.85%

A new method announced by the Bureau of Chemistry and Soils cuts the price of sorbose from $500 to 75 cents per pound. Chemically classed as a ketose sugar, sorbose is used as a starting material for the chemical synthesis of vitamin C (ascorbic acid). The process develops sorbose by the bacterial fermentation of sorbital, an alcohol made from pure corn sugar. The method depends on a newly developed type of rotary fermenter in which submerged cultures of the bacteria are used instead of the customary surface growths.

It Pays to Precool

Precooled apples keep in good condition 20 days longer than apples which have not been precooled. And each day's delay in precooling from 70 to 32 deg. cuts off about ten days of potential storage life. These are facts established through tests made recently by the Department of Agriculture. Results with peaches, berries, lettuce and green peas also show the value of precooling, a process now used extensively by shippers in commercial fruit and vegetable areas.

CONCENTRATES

• Salmon poaching in Alaska is done not only by Japanese but by non-citizens from many countries, so Senator Copeland has introduced a bill giving aliens three years to take out papers or quit fishing. Another Copeland bill, aimed at the Japanese, would annex Bering Sea as United States territory. . . . The 1938 tax bill passed by Congress reduces almost to the vanishing point the New Deal's undistributed profits tax, the tax being a maximum of 2½ per cent. . . . The United States Circuit Court of Appeals early in May upheld the Federal Trade Commission order directing Biddle Purchasing Co. and others to cease accepting commissions from sellers and passing them on to buyers in violation of the Robinson-Patman Act.

• *Price differences based on real differences in selling costs are to be encouraged, it has been ruled by a Federal statutory court in Minneapolis in a decision holding that the Minnesota Unfair Trade Practice Act is unconstitutional. . . . A clinic discussion on merchandising of frozen food will be a feature of the convention of National Associatin of Retail Grocers, to be held in Cincinnati the week of June 19. . . . A survey giving the history of the frozen food industry, describing methods of preparing, packing, storage and transporation of frozen foods and a selected list of references on quick freezing has been issued by Bureau of Foreign and Domestic Commerce.*

• Frozen bread is being distributed by North Pole Bakery, Fairbanks, Alaska. The bakery puts fresh bread in a room where the temperature is –20 deg. F. to freeze it for shipment. The product is thawed out by the consumer. . . . At the order of National Labor Relations Board, Hershey (Pa.) Chocolate Co. is disestablishing Independent Chocolate Workers of Hershey as a collective bargaining agency. . . . Swift & Co. has been held guilty of violating the Wagner Act in its plant at East St. Louis and ordered to disestablish an employees' association by a regional director of National Labor Relations Board.

• *National Labor Relations Board recently ordered John Minder & Co., New York, to cease and desist attempts to discourage membership in Almagamated Meat Cutters & Butchers Workmen of North America, an A. F. of L. affiliate. . . . The city council of Jamestown, N. Y., is planning a municipal milk plant and distribution system to serve the city's 50,000 inhabitants. . . . A short course is being sponsored by the University of Maryland, College Park, Md., from June 27 to July 16 to train technicians in the determination of molds and insect fragments, specific gravity and acidity of tomato products.*

• Courses in human problems and administration, motion and time study, management, education, personnel administration, the broader problems of management and industrial management will be given at the Eighth Annual Economics Conference to be held June 24 to July 2 at Johnsonburg, N. J., under the auspices of Stevens Institute of Technology. . . . A Work Simplification conference will be held at Lake Placid Club, N. Y., July 11 to August 20 by Allan H. Mogensen, New York. . . . An AAA marketing agreement for Irish potatoes grown in the commercial producing counties of the five Gulf States became effective May 12. . . . A proposed simplified practice recommendation covering sizes and caliper thicknesses of stock folding-boxes for cakes has been submitted to industry by National Bureau of Standards.

CAPITAL VIEWS

LOANS—Food companies needing more money for enlargement of business, if unable to get loans in the ordinary commercial way, should not be discouraged until they have really made an effort to determine how Uncle Sam proposes to help. But primarily it must be understood that loans from RFC must be based on the expectation of earnings in the business which will permit repayment of the funds into the Federal Treasury within a reasonable period of time.

Most promising for food manufacturers is the prospect of participating loans in which the customary banking arrangements will be made by some commercial bank, with the RFC only taking part of the total loan. This last arrangement will enable a small banking firm to embark on a much larger single loan than would otherwise be reasonable with its unaided resources.

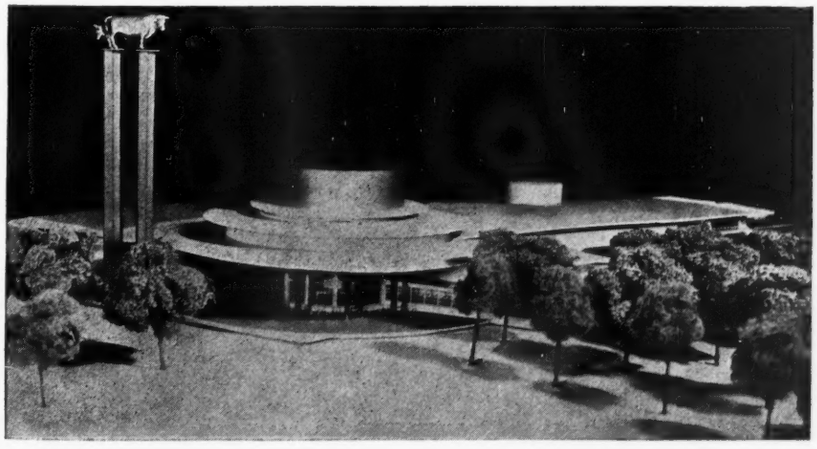
MORE EXPERIMENTS—The plan of the New Deal leaders to spend, lend and give away has not worked out as expected. Business psychology has not been improved. Not even a majority of the Democrats in official Washington favor the plan which is being forced through Congress. Some different kind of experiments can, therefore, be expected. Whatever they are—and nobody knows now—they will represent essentially an effort to get over the political hump in pre-election months. The commotion will be disturbing, but it is going to be very desirable to ignore it as much as possible. It will mean much less, in fact, than the racket would imply.

FILLED MILK ILLEGAL—The powerful dairy industry lobby secured passage of the Federal filled milk act in 1923. On April 25, 1938, the Supreme Court finally passed on this law and declared that Congress had the authority to forbid interstate shipment of such products which resemble or imitate milk. The court supported the law on the ground that Congress decided and declared: "That filled milk, as herein defined, is an adulterated article of food injurious to public health and its sale constitutes a fraud upon the public." Only one big filled-milk producer is involved, but the basic philosophy is significant for all foods. If Congress decides that something is injurious to the public health or constitutes a fraud, then Congress can stop its interstate movement. Other products of dubious standing could presumably be forbidden. But if Congress got capricious or unreasonable in such determinations or declarations, the court implies that the resulting act would not be regarded as constitutional.

COLLECTIVE TRADEMARKS—Federal trademark laws permit foreign groups, but not United States trade associations, to own and use a collective trademark under exclusive control of the user. Members of Congress are seeking to extend this right to American associations and groups which may wish thereby to protect the reputation of the products or services of their members. Those interested in supporting such legislation should communicate with the Senate committee on patents.

CAN SIZES—National Canners' Association made an impressive case before Congress regarding legislation to fix dimensions and capacities of fruit, vegetable, and milk cans. Supporting the idea of simplification in practice and reduction in number of sizes, the industry has apparently persuaded the interested members on Capitol Hill that fixing these sizes by law will not work as well as to have them fixed by industry agreement in cooperation with the Bureau of Standards, or perhaps under a Federal Trade Commission trade practice agreement. The idea of any early legislation limiting cans to the seven sizes first proposed has been abandoned.

AMPLE WARNING—Fruit canners are notified in a formal statement of April 20 by the Food & Drug Administration that standards for fill of containers are to be strictly enforced. Some later revision of the specifications is expected. But warning is issued against using excessive packing medium which is contrary to fair dealing with the consumer.



"COWSHED" IN WORLD OF TOMORROW

Model of Borden Co.'s "Dairy World of Tomorrow" exhibit at the 1939 New York World's Fair. The exhibit will center around an electrically operated rotolactor, or revolving platform, on which 15 cows will be milked automatically at one time. The rotolactor will be a small sized reproduction of the only one in the world, at the Borden-Walker-Gordon farm, Plainsboro, N. J.

Cold Storage Lockers Become Major Factor

"Although this industry is still in its infancy, there are already more than 2,000 commercial cold storages which rent more than 1,000,000 lockers to farmers for use in freezing and storing their perishable foods." That is the statement with which Prof. Donald K. Tressler, New York State Agricultural Experiment Station, Geneva, speaking at Cornell's Farm and Home Week, pictured the magnitude and importance of the cold-storage-locker business. "Many of these warehouses derive their entire income from the rental of these lockers, Professor Tressler continued. In the Pacific-Northwest and in certain Midwestern states, the use of these lockers is becoming very common. For instance, in Walla Walla, Wash., a town of 16,000 inhabitants, there are 1,400 lockers in which farmers of that vicinity freeze and store their products.

Court Spurs Action Against Filled Milk

Immediately following the recent decision of the Supreme Court upholding the constitutionality of the Federal Filled Milk Act of 1923, the Food and Drug Administration took action to stop interstate shipments of any product within the definition of filled milk.

The Filled Milk Act forbids interstate distribution of any combination of milk, cream or skimmed milk with any fat or oil, other than milk fat, so as to make it resemble milk or skimmed milk in any form. Congress declared that "filled milk is an adulterated article of food, injurious to public health" and that its sale is a fraud upon the public.

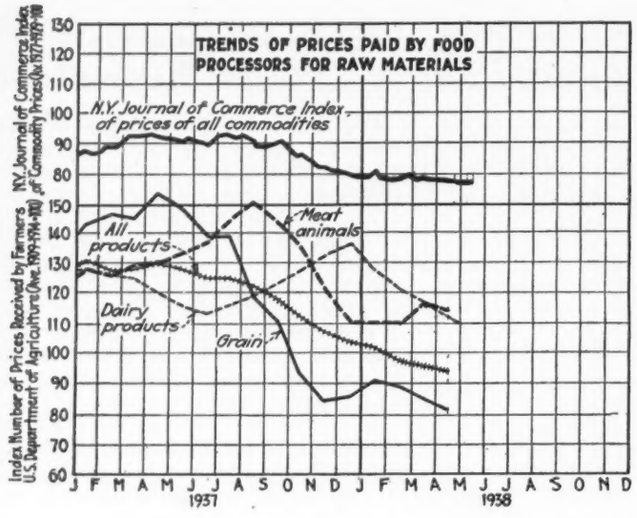
In the indictment against Carolene Products Co., the shipment of "Milnut" and "Carolene" was declared unlawful. Analyses by F & DA chemists showed the products to be composed essentially of evaporated milk and coconut oil.

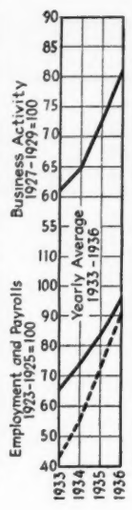
Food School Planned

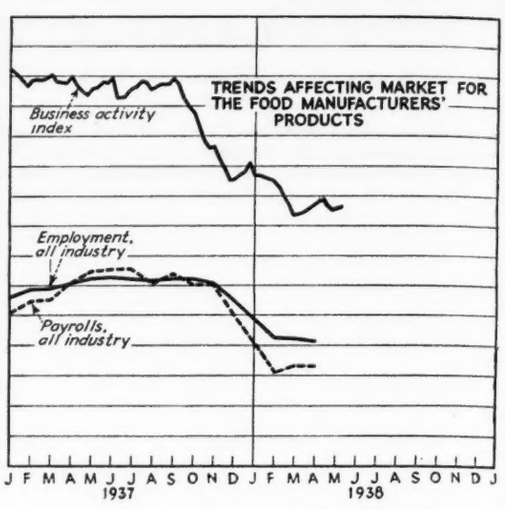
Proper preparation and cooking of foods soon will be taught to eighth and ninth grade pupils, and also to interested adults, under an experimental food trades vocational high school to be established in New York City.

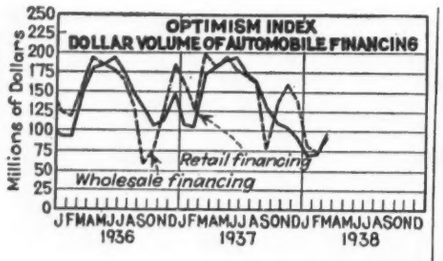
In preparation for the opening of the school, the Works Progress Administration has nearly completed general revovation of the historic old Public School 16. With the opening of the fall term, the building will be completely equipped with modern machinery, much of it contributed by prominent supply firms interested in the project, and installed by WPA engineers.

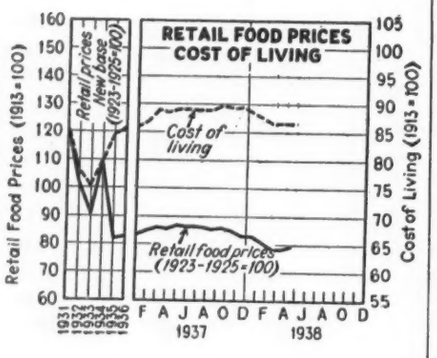
If the food school experiment develops satisfactorily, the New York board of education is understood to be contemplating establishment of a food school in each borough.

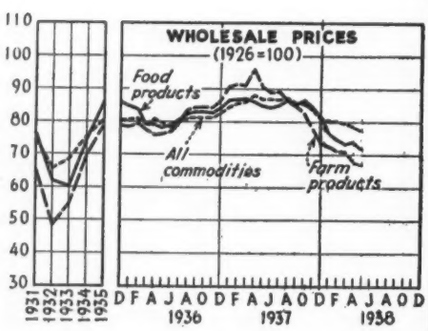

TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
Index Number of Prices Received by Farmers, U.S. Department of Agriculture (Ave. 1909-1914=100) N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1877-1913=100)
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
1937
1938











Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on retail and wholesale financing of automotive purchases is from the U. S. Department of Commerce.

BUSINESS TRENDS

Commodity Prices Show No Significant Moves

Lack of significant movement has characterized the prices of raw materials in which food manufacturers are interested during the month from mid-April to mid-May. What little change there has been, has coincided closely with movements in the general wholesale commodity price index. The performance of the weekly price index of the *New York Journal of Commerce*, which stood at 77.8 on April 16 and at 77.6 on May 14, has been typical. Moody's index, which is more sensitive, showed a decline from 141.3 to 137.2 for the same period. In the same time, Fisher's index showed a slight decline, from 81.1 to 80.8.

Futures markets have also been relatively steady, with no movements of significance other than a moderate decrease in the quotations of those commodities for which crop estimates promise large 1938 crops.

In general, wholesale prices of all commodities fell off somewhat from mid-April to the first part of May, and since then recovered almost to the mid-April figures.

Bountiful Crops Forecast

Wheat prospects, as foretold in the May 1 report of the Crop Reporting Board, promise a winter wheat yield of 754,153,000 bu., up 28,500,000 bu. above the April 1 forecast. Private estimators, as reported in the Chicago *Journal of Commerce* for May 4, are in fairly close agreement with this figure, the average of six estimates being 743,000,000 bu.

These estimates indicate that, barring unfavorable weather before the completion of harvest, the 1938 winter wheat yield will be one of the largest on record, comparing with 813,000,000 bu. harvested in 1931.

Spring wheat prospects are also for a large crop. Lamson Bros. & Co. report 1938 spring wheat acreage at 21,832,000 acres, compared to 17,514,000 acres harvested in 1937. This same source reports 1938 corn acreage at 95,266,000 acres, compared to 93,810,000 acres in 1937; oats at 36,865,000 acres, compared to 35,079,000 acres in 1937; and 10,653,000 acres of barley, compared to 9,959,000 acres in 1937. Rye production is forecast at 44,000,000 bu.

Fruit prospects for this year are not so good, according to the reports of the Bureau of Agricultural Economics. Freezing weather in April adversely affected the peach and cherry crops. Apples were not much damaged and the outlook is for a good crop, although not as large as the 1937 record yield. Strawberry acreage is larger than last year, so that, in spite of some unfavorable weather, there should be a good strawberry crop. Another good grape crop is forecast, and prospects for the 1938–39 citrus crop season is said to be favorable, as far as can be predicted at this early date.

Vegetables should be available in ample supply this year. Reports of the Bureau of Agricultural Economics indicate that the combined average yield of twenty important truck crops in 1938 should be 3 per cent over the 1937 yield and 17 per cent over the average for the past ten years. In contrast, the prospective acreage of six important vegetables for canning is 13 per cent below the acreage planted last year. These canning vegetables are cucumbers for pickles, sweet corn and tomatoes, down sharply; peas, down slightly; and snap beans and beets, steady or up slightly. Acreage of canning spinach harvested in California is expected to be 40 per cent below that of 1937.

Canned Food Stocks Are Still Large

Stocks of four principal canned vegetables, peas, corn, tomatoes and green and wax beans, in canner's hands on April 1, were considerable above the figures for the same date in 1937, in spite of the fact that the movement out of packer's hand for the first quarter of 1938 was much greater than in the same three months of the previous year. The same statement holds true for canned peaches. In contrast, stocks of canned pears were somewhat less for the date this year than in 1937.

The figures for these stocks follow: Peas, April 1, 1938, were 7,077,430 cases, all sizes; compared to an April 1, 1937, figure of 3,731,457 cases. Corn, April 1, 1938, 9,155,560 cases, all sizes; April 1, 1937, 2,628,701 cases. Tomatoes (excluding California) April 1, 1938, 4,824,583 cases, all sizes; April 1, 1937, 3,361,118 cases. Green and wax beans, April 1, 1938, 1,585,542 cases, all sizes; April 1, 1937, 419,115 cases. Peaches, April 1, 1938, 4,883,964 cases, all sizes; April 1, 1937, 2,426,734 cases. Pears, April 1, 1938, 1,549,857 cases, all sizes; April 1, 1937, 1,777,563 cases.

Cotton Oil Prospects

While cottonseed oil consumption is still high, according to the May 1 report, it is now considered unlikely that total consumption for this crop year will exceed 4,000,000 bbl. If this holds true, some 600,000 bbl. of 1937-38 oil will carry over into the 1938-39 crop year, making a total of 1,800,000 bbl. of oil on hand at the start of that year. It is therefore to be expected that, even with a smaller prospective yield of cottonseed oil from the 1938 crop, there will be an ample supply to meet domestic requirements.

Sugar Consumption Up

Per capita sugar consumption throughout the world has shown a considerable increase during the past ten years. In 1927 the figure stood at 28.7 lb., while in 1937 it was 32.4 lb., an increase of about 13 per cent. Per capita consumption in 1936 was 31.2 lb., 3.8 per cent below the 1937 record. These figures are from Lamborn & Co., whose detailed tabulation follows:

Year	World Population	World Consumption (In long tons, raw sugar)	Per Capita Consumption (In pounds raw sugar)
1937	2,115,000,000	30,549,000	32.4
1936	2,096,000,000	29,231,000	31.2
1935	2,077,000,000	27,188,000	29.3
1934	2,057,800,000	26,287,000	28.6
1933	2,041,600,000	26,193,000	27.7
1932	2,024,500,000	26,724,000	29.6
1931	2,012,800,000	27,125,000	30.2
1930	1,992,500,000	26,374,000	29.7
1929	1,962,000,000	26,967,000	30.8
1928	1,948,526,000	26,098,000	30.0
1927	1,926,715,000	24,725,000	28.7

Construction News

	Pending (thousands)	Awarded May (thousands)	Total Awarded 1938 (thousands)
Bakery	$130	$40	$435
Beverages	80	260	2,174
Canning and Preserving	189	40	155
Confectionery	50	.....	.....
Grain Mill Products	500	70	230
Ice Manufactured	120	.....	260
Meats and Meat Products	100	119	1,448
Milk Products	281	.....	435
Miscellaneous	1,477	180	3,539
	$2,927	$709	$8,676

Soybean Oil Yield Makes New Record

More soybean oil than ever before was produced in the first three months of the 1937-38 crushing season. The output for the three months was 70,000,000 lb., more than 10,000,000 lb. over the production for the same period of the preceding year, according to the Bureau of Agricultural Economics.

However, domestic consumption of soybean oil did not increase as much as production did, and hence stocks of this oil at the end of 1937 were the highest on record. This is perhaps a factor in the 4 per cent decrease registered this year in plantings of soybeans for all purposes.

Business Gets No Better

For another month business has shown no particular signs of life, apparently content to stand idly by while indexes and indicators move slowly downward. Moody's index, which stood at 141.3 on April 16, had declined to 137.2 by May 14. Fisher's index on April 16 was 81.1 and on May 14 was 80.8. The *New York Journal of Commerce's* index of business activity fell from 70.2 on April 16 to 69.1 on May 7. In the four weeks from April 16 to May 14 the *Business Week* index of business activity dropped 1.35 per cent to 58.3.

Automobile production slumped badly in the month ending May 14, falling from 62,021 per week to 47,415 per week. Steel production also fell, from 32.7 per cent of capacity to 30.4 per cent. Heavy construction was off about 11 per cent for the period, but still remained relatively high.

The United States Department of Labor indexes of wholesale prices all fell for the four weeks from April 16 to May 14, the general index dropping 1.01 per cent, the farm index 2.18 per cent, and the food index 1.10 per cent. The weekly weighted commodity price indexes of the *New York Journal of Commerce,* in the four-week period from April 23 to May 21, were not in line with Labor Department figures, showing a fall of 0.13 per cent for the general index, a fall of 3.59 per cent for the grain index and a rise of 4.21 per cent for the food index.

INDICATORS

TOMATO ACREAGE for canning purposes in 1938 will be 403,870 acres, according to planting intentions reported by the Bureau of Agricultural Economics, a drop of 14.6 per cent below 1937 acreage.

LIMA BEAN ACREAGE for canning and freezing in 1938 will be 51,780 acres, compared to 45,660 acres in 1937, according to intentions to plant reported to the Bureau of Agricultural Economics.

CONFECTIONERY and competitive chocolate product dollar sales in the first quarter of this year were 7 per cent below the figures for the corresponding period in 1937, according to the U.S. Department of Commerce.

BUTTER PRODUCTION in March was 126,489,000 lb. up 5.8 per cent over March, 1937, according to the U.S. Department of Agriculture. For the first quarter, butter production was up 7.3 per cent above the 1937 quarter.

BUTTER, creamery, in storage on May 1, 1938, was 19,540,000 lb., compared to 6,405,000 lb. on May 1, 1937, and a 1933-37 average for the date of 7,663,000 lb.

CHEESE in storage on May 1, 1938, equaled 75,985,000 lb., compared to 83,096,000 lb. on same date in 1937 and a 1933-37 May 1 average of 62,881,000 lb.

FROZEN FRUITS in storage May 1, 1938, totaled 95,092,000 lb., all kinds. On May 1, 1937, the quantity was 40,459,000 lb., while the 1933-37 May 1 average was 45,622,000 lb.

FROZEN VEGETABLES in storage on the first of May this year amounted to 21,646,000 lb. The figure for May 1, 1937, was 6,783,000 lb.

EGGS, case equivalent, in storage on May 1, 1938, were 6,616,000 cases, compared to 6,925,000 cases on May 1, 1937, and a 1933-37 average for the date of 6,124,000 cases.

POULTRY, frozen, in storage on May 1, 1938, totaled 59,971,000 lb. On May 1, 1937, the figure was 94,888,000 lb., and the 1933-37 May 1 average was 60,212,000 lb.

MEAT, all kinds, in storage and cure, on May 1, 1938, amounted to 605,848,000 lb., compared to 972,012,000 lb. on May 1, 1937, and a 1933-37 average for the date of 746,432,000 lb.

LARD in storage, May 1, 1938, was 121,702,000 lb. The May 1, 1937, figure was 209,444,000 lb. The 1933-37 May 1 average was 129,055,000 lb.

WEEKLY FOOD INDEX of Dun & Bradstreet stood at $2.34 on May 10, 1938, compared to $2.37 a month before, $2.53 on Jan. 4, 1938, and $2.84 on May 10, 1937.

MEN, JOBS and COMPANIES

INDUSTRY

» Beatrice Creamery Co., Chicago, will widen its activities to permit the use of its plant and equipment during all seasons and to make possible the utilization of byproducts. There are rumors that the new activities will include freezing of food.

» Chillicothe (Ohio) Baking Co., one of the largest baking firms in southern Ohio, has been purchased by A. E. Craig, owner of Dayton Bread Co., and associates. A new corporation, Holsum Baking Co., was formed, with Mr. Craig president.

» Conlon Baking Co., Charleston, W. Va., is constructing a $125,000 bakery.

» Curtice Brothers Co., Rochester, N.Y., has leased the Z-Pack freezing equipment of Rochester Ice and Cold Storage Utilities, Inc., from June 15 to Sept. 15. The company will quick freeze corn on the cob, peas, diced carrots, peas and carrot mixture, green beans and wax beans in 5-lb. packages for the institutional trade.

» John H. Dulany & Son, Fruitland, Md., has opened a new frozen food plant at Exmore, Va. The new plant, which is of steel and concrete construction, is in the center of a growing area and adjacent to a cold storage warehouse. The plant will quick-freeze this season strawberries, broccoli, lima and stringless beans and crabmeat. The company also operates two freezing plants at Norfolk, Va.

» Forest Hill Dairy is remodeling its plant at Memphis, Tenn., and installing additional equipment at a cost of about $45,000.

» Fresh Frozen Products Co. recently organized in Birmingham, Ala., is extending its activities and making use of the sharp freezing facilities of Alabama State Docks, Mobile, and the Birmingham Ice & Cold Storage Co. A large volume of strawberries is being handled this season.

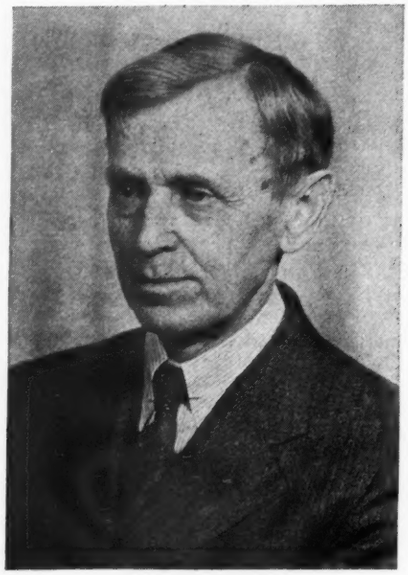
» Gast Bottling Corp., St. Louis, has awarded the contract for construction of a one-story and basement beer bottling plant.

» General Baking Co. will remodel and reequip the plant at Waterbury, Conn., at which operations were recently suspended. About $50,000 will be spent.

» Georgia Fruit Products, Inc., Atlanta, has purchased the old Tom Huston frozen-peach plant in Montezuma.

» Kraft-Phenix Cheese Corp. is locating a cheese plant in Sulphur Springs, Tex., this to be in operation this month. The plant will have a capacity of 100,000 gal. of milk daily.

» National Meat Industries, Ltd., plans to build a one million dollar meat packing plant and abattoir at Ste. Therese, Que.



DR. C. O. SWANSON

American Association of Cereal Chemists has awarded him the Thomas Burr Osborne medal for distinguished contributions to the cereal industry through original research. Dr. Swanson is head of the department of milling industry, Kansas State College of Agriculture and Applied Science, Manhattan, Kan.

EDWIN L. HARDING

He has been appointed secretary and general counsel of Kellogg Co., Battle Creek, Mich. He formerly was a partner in the law firm of Defrees, Buckingham, Jones & Hoffman, Chicago.

» Pond Brothers Peanut Co., Suffolk, Va., suffered a loss estimated at $150,000 recently when its warehouse was destroyed by fire.

» Sailsbury (N.C.) Coca-Cola Bottling Co. is building a $100,000 plant, to be completed by Oct. 15.

» Standard Brands, Inc., has started construction of a pickle plant in Texarkana, Ark.

» Standard Pickle Co., Cleveland, has moved into a new plant, tripling its space.

» Stokely Bros. & Co., Indianapolis, has purchased the Brandon (Wis.) Canning Co.

» Tobin Packing Co., Fort Dodge, Ia., recently let the contract for a $100,000 addition to its plant. The new building will be used for processing hams and bacon and manufacturing sausage.

» Tri-State Milling Co., Rapid City, S.D., has begun construction of a new modern air conditioned flour mill with a daily capacity of 600 bbl.

» J. L. Tuttle Co., Inc., has opened a new dairy products plant at Oakland, Calif. The plant has 10,000 sq.ft. of floor space.

» White Dairy, Birmingham, Ala., is building a $100,000 model pasteurizing plant.

PERSONNEL

» A. M. Beebe, San Francisco, has been elected president of Drake's Bay Oyster Co., succeeding O. V. Wykoff.

» R. C. Blanton recently was renamed president of National Association of Manufacturers of Self-Rising and Processing Flours.

» Fred Blumer, who resigned recently as president of Blumer Brewing Co., Monroe, Wis., and is now associated with Blatz Brewing Co. at its Janesville, Wis., plant.

» William P. Bradley has been elected chairman of the board of Ekhardt & Becker Brewing Co., Detroit.

» Thomas Bryce resigned recently as vice-president of the G. Krueger Brewing Co., Newark, N. J.

» L. E. Carmichael, Eldorado, has been elected president of Arkansas Bakers Association, succeeding W. Jack Coffey.

» Thomas Corner, for the past six

years manager of Michigan Bean Co., Alma, has been appointed manager of Alma Roller Mills, recently purchased by Harris Milling Co. F. E. Marshall succeeded Mr. Corner as manager of Michigan Bean Co.

» ORVLLE E. DROEGE has been appointed manager of the poultry and dairy department of Swift & Co., Chicago, succeeding W. F. Jackson, who retired on pension.

» F. M. DUPONT, formerly of Wahl Henius Institute, is now technical director of Blatz Brewing Co., Milwaukee, and U. S. Brewing Co., Chicago.

» JOSEPH EROS has become general manager of Crawford Johnson & Co., Birmingham bottlers of Coca-Cola.

» WALTER FRANZ has succeeded W. H. Kraft as general manager of Miller Brewing Co., Milwaukee, Wis.

» GENE GERETY has taken two years leave of absence from Booth Fisheries to serve as executive secretary of the Food Industry of Western New York, a new organization with a membership of 131 firms and 15,000 employees.

» HERBERT L. GRAVES, Lafayette, has succeeded Vern C. Vanderbilt, Indianapolis, as president of Indiana Bakers Association.

» C. E. KAFKA, production manager of National Tea Co., Chicago, has been advanced into the stores operations division as assistant to B. J. Dickens, head of that division and secretary of the company. Arthur Erie, formerly assistant to Mr. Kafka, has been put in charge of production activities.

» ERNEST KELLY, who has had charge of the Bureau of Dairy Industry's investigational work in milk-market problems since 1912, has been named assistant chief of the Bureau.

» JOHN D. KELLEY, acting manager of the St. Louis (Mich.), plant of Lake Shore Sugar Co., has been appointed to that position permanently. He also retains managership of the Holland (Mich.) plant of the company.

» A. L. MCDONALD, president of McDonald Ice Cream Co., Ann Arbor, Mich., recently was re-elected vice-president of Michigan Association of Ice Cream Manufacturers.

» WM. AYER MCKINNEY, president of Kitchen Art Foods, Inc., Chicago, has been elected president of Chicago Rotary Club.

» ARTHUR MELVIN, Dowagiac, Mich., has become president of the Michigan district of Association of Operative Millers, succeeding Harry Foltz.

» DR. E. T. OAKES, formerly production manager of National Biscuit Co., New York, is now with Loose-Wiles Biscuit Co., Long Island City, N. Y.

» LAWRENCE F. ORTMAN, Omaha, again heads up the Nebraska Master Bakers Association.

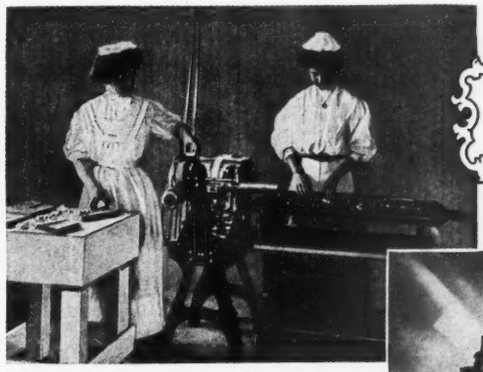
» HENRY A. PAGE, JR., is now general manager of Consumers' Dairy Co., Toledo.

» ROBERT SCHIERING has been elected president of French-Bauer, Inc., Cincinnati, succeeding Harry Hartke, resigned. Mr. Schiering was president of Cooperative Pure Milk Association, which controls the common stock of French-Bauer, Inc.

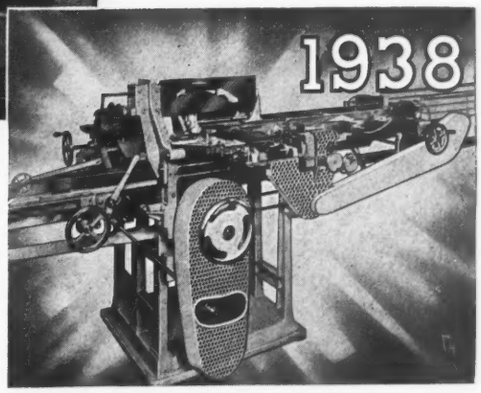
» DR. H. L. A. TARR has been appointed assistant bacteriologist on the staff of Pacific Fisheries Experimental Station at Prince Rupert, B.C.

» CHARLES A. THAYER, of R. T. French Co., Rochester, N. Y., again heads up American Spice Trade Association. Mr. Thayer reports that a current evil in the spice trade is the use of a 3- or 4-oz. can for 1 or 1½ oz. net weight of spice. The Association is working to stop this practice.

» E. S. WANGENHEIM recently was elected chairman of the board of California Conserving Co., San Francisco. M. E. Wangenheim is president; N. W. Stern, vice-president and treasurer; E. P. Gesellchen, vice-president in charge



Speed demons of 1913 using the "last word" in wrapping machines



Modern adjustable wrapping machine . . . one of our 78 models

25 years of experience

AT YOUR SERVICE

In serving the Package Goods Industry for the past 25 years, it has been our policy to pioneer improvements . . . to experiment and to continually devise new machines to meet new requirements . . . to assist manufacturers in their search for faster, better, more economical, and more sales-appealing wrapping.

Today, with wide experience as a background, we offer models covering virtually every industry in which packaged goods are produced.

In the past few years, progress in wrapping machine design has been more rapid than ever before . . . which gives manufacturers opportunity for even greater economies. Speed and operating efficiency have been increased to an unprecedented degree. These modern machines are extremely adjustable, handling a wide range of sizes, shapes, and types of products—and they use all kinds of wrapping materials.

Why not find out what 25 years of experience can offer *you?* See if your package can be improved, your costs lowered. Our customers—leading manufacturers in the United States and in 35 foreign countries—consult us regularly for this purpose. Get in touch with our nearest office.

PACKAGE MACHINERY COMPANY, Springfield, Massachusetts

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Mexico, D. F., Apartado 2303 Buenos Aires: Argentina: David H. Orton, Palpu 231

25th ANNIVERSARY

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

of sales; C. F. Roberts, vice-president in charge of production; and R. S. Goldman, secretary.

» C. M. Wellington has been placed in charge of the New England territory of International Salt Co., Inc.

DEATHS

» William G. Andres, 50, superintendent of Kasco Mills, Inc., Toledo, April 22.

» Rudolph M. Booraem, 79, for many years a director and chairman of the technical staff of Great Western Sugar Co., recently, at Charlottesville, Va.

» Carl A. Burckhart, 55, superintendent of C. Schmidt & Sons, Philadelphia, April 25.

» Mrs. Alice Clarke, for a number of years head of the department of food production, supervision and service of Frank G. Shattuck Co., recently, in Brooklyn, N.Y.

» Peter W. Eulberg, 73, part owner of Eulberg Brewing Co., Portage, Wis., May 5.

» William Hugh Gear, 74, vice-president of Gear Dairy Co., Menasha, Wis., April 29.

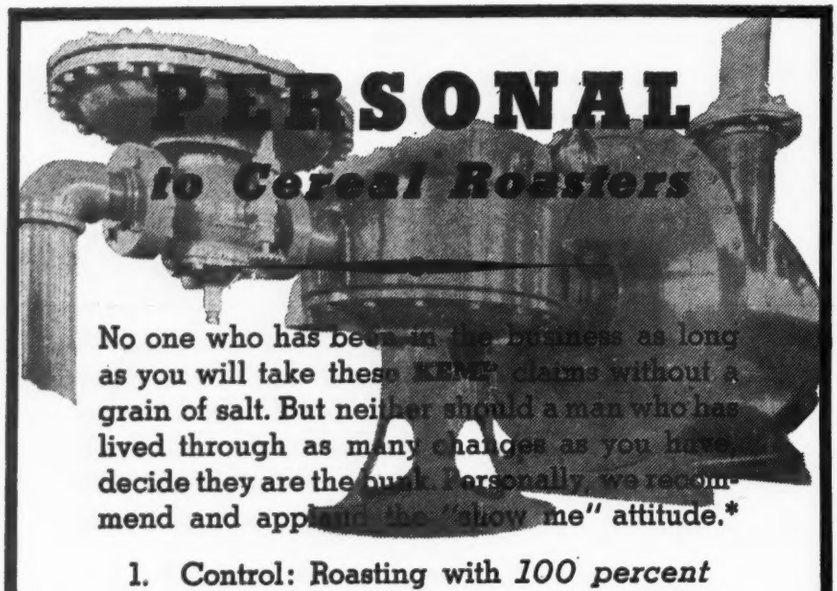
» Dr. J. R. Katz, 56, international authority on colloid chemistry, formerly of the University of Amsterdam, Netherlands, April 19, in Brookline, Mass.

» Bryant T. Manard, 56, president of Manard Molasses Co. and identified with the molasses industry for 30 years, April 30, at New Orleans.

» James H. Nunnally, 78, founder and former president of Nunnally Co., candy company of Atlanta, May 9.

» Joseph F. Schneider, founder of the Schneider Grocery & Baking Co., Cincinnati, which was taken over by Kroger Grocery & Baking Co., recently, in Cincinnati.

» Henry E. Schortmeier, 90, founder of Silver Leaf Baking Co., Shelbyville, Ind., and Grocers Baking Co., Indianapolis, recently.



No one who has been in the business as long as you will take these KEMP* claims without a grain of salt. But neither should a man who has lived through as many changes as you have, decide they are the bunk. Personally, we recommend and applaud the "show me" attitude.*

1. Control: Roasting with *100 percent premixed* gas and air from the **KEMP** Industrial Carburetor provides *automatically,* more uniform heat-liberation and closer temperature control *than you are now getting.*

2. Fuel Saving: Roasting with **KEMP** equipment means your fuel bills will be materially less *than they now are.*

Hence, if you really want to make production limits *finer,* and save money doing it, by all means check into what Kemp has to offer. Address The **C. M. Kemp Mfg. Co., 405 East Oliver Street, Baltimore, Maryland.**

E. G. As demonstrated by Ralston-Purina and others . . . who are now firing roasters with 100 per cent premixed gas and air from* **KEMP *Industrial Carburetors.*

KEMP of BALTIMORE

ASSOCIATED INDUSTRIES

» Bastian-Blessing Co., Chicago, has promoted Edwin D. Higgins to the managership of its New York branch, succeeding C. Q. Sherman, resigned.

» Carnegie-Illinois Steel Corp., Pittsburgh, has appointed William P. Andrews manager of sales in the Cincinnati district.

» Creamery Package Manufacturing Co. has named H. L. Rietveld manager of its Omaha sales branch and warehouse.

» J. L. Ferguson Co. has appointed E. P. Lastrapes, New Orleans, representative for the Packomatic line.

» B. F. Goodrich Co., Akron, has appointed William S. Richardson general sales manager of the mechanical goods division.

» Liquid Carbonic Corp. has opened a new plant for the manufacture of dry ice and carbon dioxide gas at Memphis.

» Mack - International Motor Truck Corp., Long Island City, N. Y., has elected R. D. Hilty vice-president.

» Read Machinery Co., Inc., has appointed Hamilton Oven & Equipment Co., Los Angeles, as sales and service representative in southern California and in Arizona and New Mexico.

» Westinghouse Electric & Manufacturing Co. is centralizing the manufacture and sale of its electric dust precipitating unit in its Cleveland division.

» Wilson & Bennett Manufacturing Co. has elected Stevens A. Bennett chairman of the board and general manager, and Harry M. Gustafson, president.

Quality Control

(*Continued from page 323*)

packages should be placed on racks rather than stacked in a pile. Further, the center of the package should be 0 deg. F. or lower before it is placed in a shipping container.

Since frozen vegetables are not sterilized during either the blanching or freezing process, it is essential that a vegetable freezing plant be absolutely sanitary in every detail. Vegetable juices are excellent media for the growth of a large number of types of bacteria, yeasts and molds. For this reason conveyors, inspection belts, containers, etc., are likely to cause serious contamination of the product with microorganisms unless great care is taken to scrub and to sterilize them often. A study of the bacterial count of peas undergoing preparation for freezing indicated that, although the blanching operation reduced the count to a very low point, the peas picked up enough microorganisms as they passed through the remainder of the process of preparation to bring the count above 100,000 per gram. The principal source of contamination was the sorting belt. Passage of this belt through a germicidal solution eliminated that source of contamination.

From time to time an hourly bacterial count on the finished product should be made throughout an entire day. If the count remains uniformly low throughout the day, it is evident that excellent sanitation is being maintained in the plant. On the other hand, if the samples taken the first hour or two are low in microoganisms but samples taken later in the day show considerably larger numbers of bacteria, means of eliminating contamination should be studied.

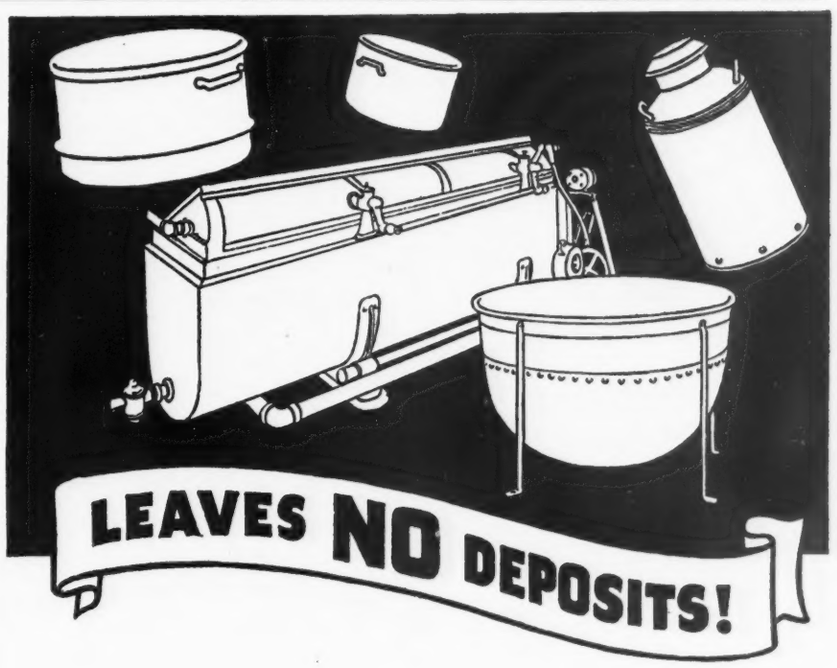
The type of microorganisms occurring on the finished product should be studied carefully from time to time. If considerable numbers of *B. Coli* are found, packing operations should be stopped until the cause of the contamination is discovered.

When properly handled and packed in a sanitary plant, the numbers of bacteria on frozen vegetables will ordinarily be less than 50,000 and should not exceed 100,000 per gram. In other words, the bacterial content should not be much above that of Grade A milk. If the numbers of bacteria found on a frozen vegetable exceed 300,000 per gram, it is probable that one of the following conditions caused the high count:

(1) Contamination occurring in the packing plant,
(2) improper cooling after blanching,
(3) delays occurring between blanching and freezing,
(4) slow freezing,
(5) partial or complete thawing of the frozen product.

Since the bacterial count is such an excellent index of the sanitary condition of the packing plant and the care with which the product has been handled during and after packing, bacterial examinations of sample packages taken immediately after freezing, after storage, and from the retailer or wholesaler should be made in the quality control laboratory as part of the regular routine.

From the above brief consideration of the necessity for careful watching of the product during packing and freezing operations, it is evident that a representative of the quality control laboratory should be on the job in the factory at all times when packing operations are in progress. He should be given a free hand to study the processes employed and to determine if they are the best available. Not only should the man in charge of quality control in the plant watch all operations closely but he should cook a representative sample of the



Have you checked to SEE . . do you KNOW whether the chlorine sterilizing solution you use on processing equipment and utensils leaves a residue or white deposit? If it does, it is a sign that it does not rinse or drain away thoroughly and that there is a possibility of it affecting flavor and quality of your product

Avoid the uncertainty of this by using

OAKITE BACTERICIDE

IT LEAVES NO RESIDUE or WHITE DEPOSIT WHATSOEVER because it is completely and instantly soluble, gives a clear solution that rinses away COMPLETELY.

Due to its more active form of available chlorine, this amazing material goes about its bacteria destroying function immediately on contact with equipment. Dependable, economical, it provides daily assurance against contamination of product . . . safeguards quality.

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OAKITE CERTIFIED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

product every two or three hours and examine it carefully for anything unusual in the way of flavor, color, texture, insects and foreign matter.

When actual packing operations are not in progress, the quality control laboratory will be busy checking up on the quality of the products in storage and those in the hands of the retailer and wholesaler. Inspectors should keep constant watch to see that low temperatures are maintained in refrigerator cars and trucks (used for transportation of frosted vegetables), in warehouses, and retail cabinets. Zero degrees Fahrenheit should be the maximum permissible storage temperature for all products to be held three months or longer. Much misinformation concerning desirable storage temperatures has been given out by certain government laboratory workers and others. Temperatures as high as + 15 deg. F. have been recommended for freezing and storage. At + 15 deg. F. most frozen vegetables rapidly lose their color, flavor, aroma and vitamin C content. The carotene content may also decrease at this temperature. Products held at this temperature for longer than two months will have lost their fresh qualities and soon become unsalable. In our laboratory we have found that the vitamin C content of a frozen vegetable is an excellent index of its quality. Frozen vegetables low in this vitamin were either overmature when harvested or were mishandled during preparation and freezing, or they had been stored at too high a temperature. Thus it is evident that a periodic check on the vitamin C content of all vegetables held in storage is an excellent way of learning how well they are keeping.

Canners in particular should remember that even at 0 deg. F. all frozen products deteriorate slowly during storage. *The lower the storage temperature, the slower the rate of deterioration.* Unblanched vegetables can actually be held in excellent condition for several months at —40 deg. F. or lower, whereas at 0 deg. F. these vegetables soon become inedible. Snap beans, mushrooms and asparagus deteriorate more rapidly than other vegetables; therefore, they should be stored at lower temperatures and watched more closely.

It is not only essential that the storage temperature for vegetables and most other frozen foods be low, but it is also important that it fluctuate very little. Fluctuating storage temperatures cause excessive desiccation or freezer burn. Desiccated (dried out) vegetables are likely to be tough, flavorless and of poor color.

If retailers' storage cabinets are held at temperatures above 0 deg. F., a very careful check must be kept to see that products are not kept in the cabinets longer than two or three weeks. Otherwise the dealer will soon be loaded up with desiccated products of poor color, flavor and appearance. The author believes that the date of delivery of the product to the retailer should be stamped or otherwise marked on each package and that no retailer should be permitted to keep any products in his case for longer than three weeks. To enforce such a regulation, the packer would have to make an inspection of the dealer's cabinet about twice a month. This may seem like a drastic rule, but it will pay in the long run.

Quality Control In The Packing Of Other Frozen Foods

The quality of frozen fish, shellfish, meats, poultry, fruits, fruit juices, and dairy products should be watched just as closely as indicated above for frozen vegetables. In fact it requires even more careful attention to quality to produce high grade quick frozen

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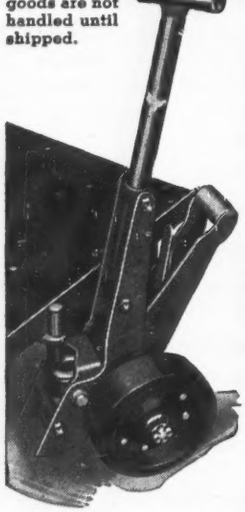

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fish. Further, frozen fish deteriorate in storage faster than do vegetables.

Frozen poultry is especially subject to freezer burn or desiccation.

Hardest of all is the job of packing frozen beef of uniformly high quality. There is so little excellent beef available and so much is offered as first quality, that the quality inspector must be very alert or some tough meat will be packed.

Plant sanitation is of great importance in the fish, shellfish, meat and poultry freezing industries. If the operators do not keep their packing plant in order, the government officials are sure to make trouble.

Personnel of A Quality Control Laboratory

From the foregoing it is evident that any well organized quality control laboratory must include at least the following men: (1) food technologists, (2) a bacteriologist (3) a chemist. A nutrition worker and a cookery expert should be included if the packing operations are conducted on a large scale or on a great variety of products. The number of food technologists will be governed by the number of packing plants operating at one time, for at least one expert inspector should be on the job at all times in each factory during the packing season. As previously indicated, the inspector should have absolute authority over quality and should be responsible to the general manager and not to the factory superintendent. If the factory operations are large, a chemist should also be in the factory to aid the food technologist in maintaining quality control.

Periodical factory inspections by the bacteriologist should also be made. If the operations are not large, the chemist can make the necessary vitamin determinations from time to time and thus eliminate the need for a nutrition expert.

There should be a research and development laboratory in a frozen food business of any size. This department should not only study new and improved frozen products, but should work hand in hand with the quality control laboratory in improving methods of preparing, packing, freezing, transporting and storing the regular line of frozen foods. If this system is followed, some food technologists, chemists and bacteriologists can be shifted from quality control to research during the off season.

In any case, the production department should cooperate with the quality control laboratory in keeping complete detailed records concerning each day's production, and each shipping container, and preferably each package should be marked with a code. In case of faulty products, it is essential to be able to trace the product back to a given day's run in a certain factory. If this can be done, and if the quality control records are accurate, it is usually possible to find out the cause of the difficulty and eliminate it in future packs.

If such a quality control system and laboratory is employed by each packer of frozen foods, assuming a reasonably fortunate selection of personnel, the future of the frozen foods industries is assured. If, on the other hand, any considerable proportion of the frozen foods is packed without adequate quality control, sooner or later inferior goods in large quantity will be placed on the market and the sale of these products will slump. Then, all producers of frozen foods will suffer because of lack of discrimination of brands on the part of a large portion of the buying public. Thus it is evident that the future of the frozen foods industries depends to a considerable extent upon the universal adoption of self-enforced quality control.

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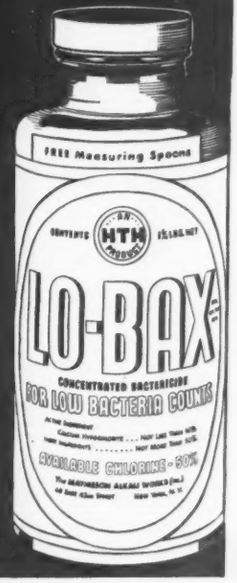

SPOILAGE losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard *your* products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.

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Olive Oil

(*Continued from page 330*)

and are often used for blending to enable the packer to meet the various flavor specifications of his markets. Unlike most other vegetable oils, olive oil is for the most part left unrefined, or remains "virgin." The use of refined olive oil helps in the standardization of different types and qualities. It is just as pure as the "virgin" oil.

Olive oil is actually a fruit oil. Other popularly used edible oils, classed as vegetable oils, are really nut or seed oils. They are represented by cottonseed, rapeseed, sesame seed, tea seed, sunflower seed, grape seed, soya, peanut, coconut, and palm kernel oils. Palm oil is a fruit oil or fat, but it is generally regarded as a soap stock oil.

Recently a controversy has arisen questioning the general opinion that a refined olive oil will not become cloudy or solid in cold weather as quickly as will an unrefined oil. My personal experience has shown that a refined oil will not cloud or solidify as quickly as will an unrefined oil. Evidently much depends upon the refining process used.

The clouding or solidifying property of an olive oil is often of great importance to a manufacturer whose product must withstand fairly low temperatures. In the face of the controversy that has arisen, an olive oil to be used in cold weather products should be tested for its cold weather properties before being purchased, or at least before being used in such products.

It has been suggested that the addition of 0.10 to 0.50 per cent of air-blown cocoa butter (iodine value 20) to an olive oil will keep it free from stearine cloud or precipitate during storage at 2 to 4 deg. C. Under similar conditions, an untreated olive oil becomes solid in twelve hours. In my opinion when any foreign oil is added to an olive oil without its being declared, the oil may be classed as being adulterated. (1)

Extracted oils are obtained from "virgin" oils press cakes or olive pulp by the solvent action of carbon bisulphide, carbon tetrachloride, trichlorethylene, naptha, and non-inflammable mixtures of benzene and gasoline with carbon tetrachloride and trichlorethylene. (2)

Oil obtained by extraction of olive pulp with carbon bisulphide is known as "Orujo" (sulphur oil) or to the American trade as "olive oil foots" and is used for industrial purposes.

Through extraction, an oil has been separated having an acid content ranging from 30 to 75 per cent, (calculated as oleic acid), and a color ranging from dark green to a brownish olive. The low acid, extracted pulp oils can be refined with caustic soda to have a free fatty acid content of less than 0.50 per cent and generally a beautiful dark green color. The color can be removed by either chemicals or bleaching earth to give an oil varying from a pale yellow to almost white, depending upon the number of times the oil has been run through the bleaching process.

This type of oil is known as "refined extracted," "technical," or "industrial." It can be deodorized and washed to contain but traces of solvent if refined to a very low acid content. It is simply a liquid grease without flavor, odor, or color and is used for industrial purposes.

The remaining types of olive oils are known as "acid oil" or "oleine." They result when the soaps formed during the caustic soda refining are treated with an acid to hydrolyze them back to free fatty acids.

These acids may be bright green, yellow or even brown in color depend-

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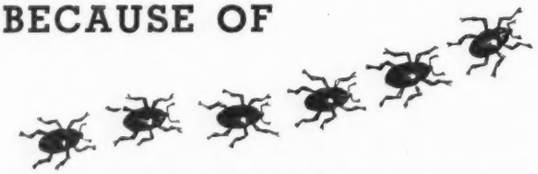

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ing upon the olive oil that was refined. They may be distilled to give distilled oleine of acids and are generally used for making soap or emulsions for the textile and other non-food industries.

In Italy the official classification of olive oil at present is: 1. Superfine virgin, 2. Fine olive oil, 3. Olive oil, 4. Rectified olive oil A., 5. Rectified olive oil B., 6. Clear oil, 7. Washed oil, and 8. Solvent extracted oils.

"Superfine virgin" olive oil is that oil mechanically pressed from olives without treatment except washing, sedimentation and filtration. It contains not over 1.2 per cent acidity calculated as oleic acid.

"Fine" olive oil is the same as superfine virgin except that the acidity shall not be more than 2.5 per cent. Most are less than 1 per cent.

"Olive oil" differs from superfine virgin and fine only in that the acidity shall not be more than 4 per cent.

"Rectified A" is the clear product resulting from clear or washed oil made edible through refining and containing no trace of chemical agents and is generally used to blend with virgin oils.

"Rectified B" is the product resulting from oil extracted by solvent from olive marc, or residue, made edible through chemical treatment, and containing no traces of solvent or other chemical agents.

"Clear" oil is mechanically obtained from olives, has not undergone any chemical treatment, does not contain more than 4 per cent acidity as oleic acid, and does not possess an unpleasant, rancid, putrid, smoky, moldy, or wormy odor.

"Washed" oil results from washing olive marc or residue.

"Solvent extracted" oil is obtained by treating olive marc with solvents and is used industrially, not as a food.

Use of the term "fine" olive oil is also permitted for designating a mixture of "superfine virgin" and "rectified A" olive oils, as long as the mixture contains not more than 2.5 per cent acidity calculated as oleic acid. Likewise "olive oil" is permitted to identify a mixture of "fine" and "rectified B" olive oils providing the blend contains not over 4 per cent acidity calculated as oleic acid. (3)

OLIVE OIL is normally a relatively stable oil and keeps sweet very well even at a fairly high temperature provided it is not directly exposed to sunlight and air. An olive oil sealed in a pint can for ten years gave a negative rancidity test, a free fatty acid content of only 1.2 per cent calculated as oleic acid. Olive oil exposed to sunlight in stoppered glass bottles and to sunlight and air in open petri dishes showed positive on test for rancidity and a bleaching in color. The oil in the stoppered bottles showed very little, practically no change in acidity over a five-weeks period although the oil started to bleach after 120 hours and indicated only slight traces of rancidity. That in the open petri dishes began to bleach in 96 hours and to show traces of rancidity. After the bleaching once started, both it and the development of rancidity proceeded very rapidly.

Bottles of olive oil wrapped in black and in white paper were exposed to direct sunlight for several months. After an eight months period that sample wrapped in white paper showed traces of rancidity while that in black paper remained sweet.

In order to obtain, if only slightly, the precious flavor of olive oil, cottonseed, rapeseed, sesame, peanut, corn, sunflower, and soya oils are commonly used to make salad blends with olive oil. These mixtures generally contain only 15 to 20 per cent olive oil. Sometimes one of these blended oil mixtures finds its way into a container marked "pure olive oil." Such an

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"accident" is likely to be the beginning of trouble for someone as it is a violation of Federal Food and Drug Administration labeling regulations.

In the past several months there have been court suits over the adulteration of olive oil with tea seed oil. (4)

It seems almost incredible that anyone would be so foolish as to try to color mineral oil and sell it for olive oil. Yet such has been attempted and the test sample was an excellent imitation in color, but atrocious in taste.

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3. Bulletin, Italian Chamber of Commerce in New York, p. 18, February 16, 1937.
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Unreached Markets

(*Continued from page 329*)

The nub of the bakers' problem appears to be the lack of variety of their products.

The first task of the industry is to promote bread eating, not as a morning ritual of two slices of toast, or as a mere carrier for a meat sandwich, but as *bread*. The art of real bread making, with that appealing odor, texture and taste that has defied imitation, is not yet lost. Place such bread before a healthy adult or child, and it will be consumed fast enough to make moisture retaining wrapping and preslicing unnecessary. There is no mistake about it; customs, social and economic conditions may change; but humanity will eat MORE of good tasting food than of indifferent tasting food.

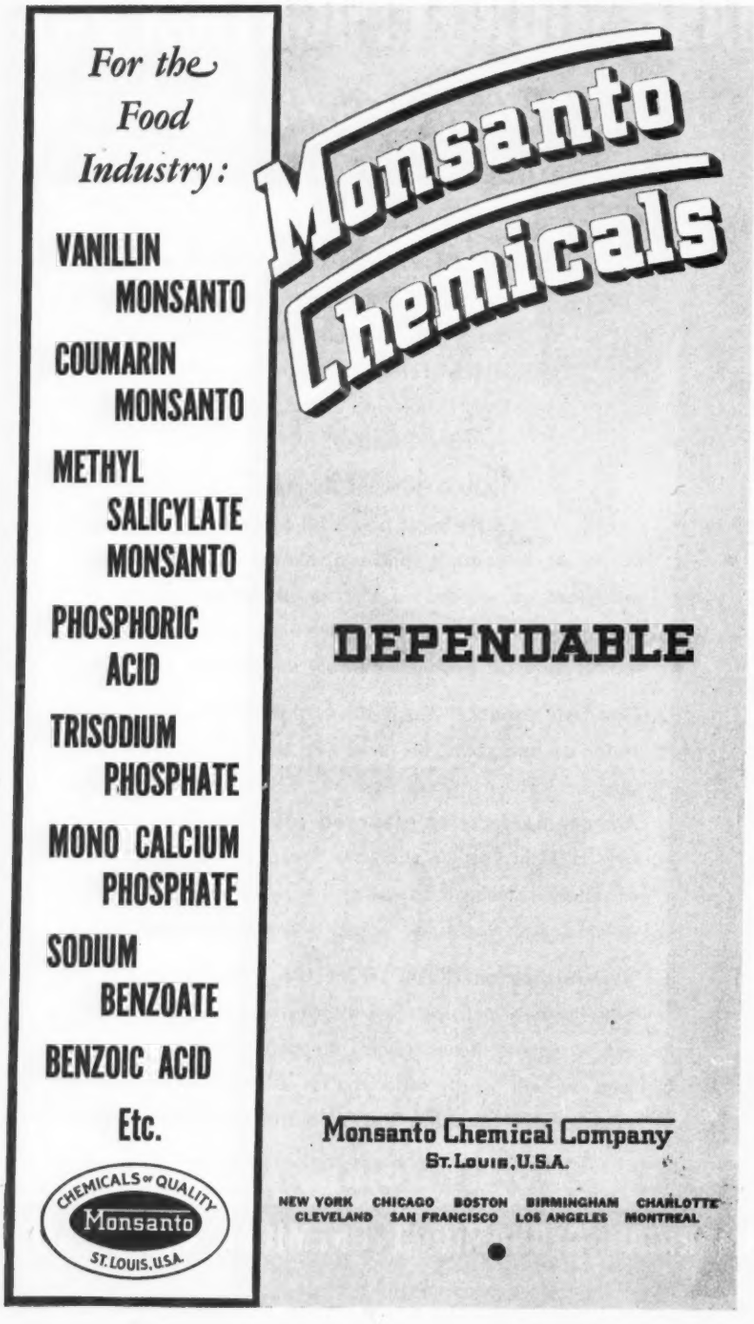
Better tasting bread is one of the answers to the baker's prayer for increased bread consumption. The gradual introduction of smaller loaves of higher quality (in addition to the standard product) without slicing, without unwise packaging would be the first step. The market is here, willing and able to pay the price.

But why stop with bread? Is there anything more satisfying to the eye, nose or palate than fresh crisp rolls? The past difficulties of the industry in promoting the consumption of rolls on a large scale has been due to the fact that the average housewife neither knows how, nor has the facilities, to warm the rolls in the proper manner because the oven is used so little in the average household. For the solution of this problem, the bakers could take a hint from the experience of other industries which have secured the cooperation of the manufacturers of household appliances and thus produced the right tools for the handling of their products.

It is possible that the redesign of the familiar electric toaster to provide a compartment for the proper warming and crisping of rolls might be undertaken by the appliance manufacturers if the baking industry should earnestly desire it and would cooperate to make it a needed device for a special size of rolls.

A large number of possible angles of constructive attack on the baker's problems could be related here, but space does not permit. Nevertheless, it is desirable to go after the potential unreached market. But to reach it bakers must have more than velleity—a perfectly good word that is little used in the English language, and which means the very lowest degree of desire—a desire barely more pronounced than a faint hope.

This discussion of the unreached potential market for bakery products is concluded with this installment. Its constructional nature may stimulate you to write a letter to the editor about it—or to the author. Your views will be welcomed.—The Editors.



How Stabilizers Work

(*Continued from page 325*)

The addition of foam stabilizing colloids is necessary in order to produce a permanent air emulsion."

The function of a stabilizing agent in ice cream making is two fold. First, it is used to stabilize the emulsion of the milk fat and the rest of the ingredients used to make the finished homogenized ice cream mix. Second, it enters in when the ice cream mix is whipped or beaten during the freezing operation. Some ice cream mixes are harder to whip than others, and this is measured by the percentage of over-run obtained during a given period of time. In other words, some 20 qt. of ice cream mix will require six minutes of freezing to obtain 95 to 100 per cent over-run, while the same volume of another ice cream mix may take twelve minutes or more, and the finished ice cream will fall short of 95 to 100 per cent over-run.

How can such a condition be explained? In many cases the explanation can be found in the nature of the stabilizing agent used, assuming the two mixes that were compared to be identical except for the use of different stabilizers, or different quantities of the same stabilizer. In other words, the stabilizer used in the manufacture of ice cream must furnish sufficient colloidal material to replace the plasma colloids adsorbed by the increased surface area of the fat globules that was brought about by the homogenization of the entire mix. Also, the nature of the stabilizing agent employed must be such as to stabilize the foam formed by the beating action during freezing.

At one time it was considered important to have a stabilizer that would form a gel upon cooling, thus acting as a mechanical or physical binder or thickener rather than as a colloidal stabilizer. This conception of the function of an ice cream stabilizer is now losing ground. The newer type of stabilizer that is gaining acceptance in the ice cream industry is one that blends with the colloidal plasma of the mix. It furnishes the necessary material to be adsorbed by the suspended particles of butterfat and serum solids, to form the highly stabilized emulsion and suspension of the ice cream mix. It also aids in establishing the air cell structure formed during the freezing process by stabilizing the walls of the air cells, thus preventing the structure of the ice cream from shrinking or collapsing.

A great variety of stabilizing agents naturally occur among animal and vegetable materials. The best natural example of a stabilizer in the animal kingdom is collagen, found in bones, hides and horny parts. Collagen is extracted and treated chemically to obtain the material known as gelatine.

Gums and pectins, abundant in seeds, fruits, foliage and sap, are among the common stabilizing agents of vegetable origin. The gums most commonly used are Gum Karaya or Indian Gum, Gum Tragacanth, Gum Arabic, the gum derived from the seeds of St. John's Bread, Irish Moss, and Locust Bean Gum.

There is also a group used in stabilizing ice cream mix which includes rennet, an enzyme derived from calves' stomachs; agar agar, extracted from sea weeds; sodium alginate, a concentrated extract of kelp, chemically treated and known as "Dairiloid"; "Lako-Sol," a modified preparation of locust bean gum; "Jeltex"; "Krayban," and a host of mechanical mixtures of gums and moss with admixtures of various salts used to improve the stabilizing action.

When fillers such as starches and tapioca flour were used for the purpose for which stabilizers are now

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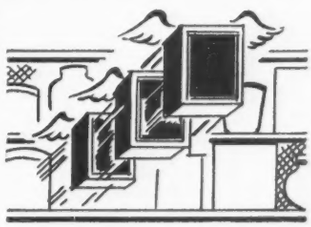

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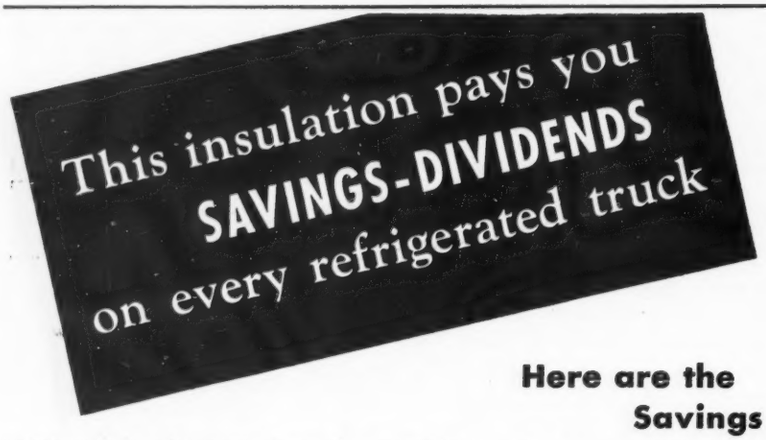
employed, there was considerable consumer dissatisfaction. Even now, consumers still recall these fillers with distaste, although present stabilizers are a decided improvement. Legislation ruled out these "starchy" fillers, but permits the use of 0.5 to 1 per cent of a modern stabilizer in the ice cream mix. Among the permitted stabilizers are gelatine, the edible gums, sodium alginate, and various modifications of these products.

Modern practice in making ice cream mix points to the use of these permitted stabilizers. Some manufacturers blend gelatine with sodium alginate. Others use a mixture of locust bean gum and sodium alginate. But the majority prefer to use a single stabilizing agent. The amount used will depend upon the nature of the mix and also upon local preferences as to the character of the finished ice cream. But, in any case, the use of stabilizing agents is an accepted practice in the commercial production of ice cream.

The same considerations advanced in connection with the use of stabilizers in ice cream mixes hold also for their use in other food products requiring smoothness of body, firmness of structure, and freedom from sedimentation and "wheying off" or "break" in texture. The use of a stabilizer in such a product may spell the difference between an attractive, eye-appealing product which is a commercial success, and an unattractive product which is a failure.



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4 It is so light in weight that it adds little to the dead-weight of the truck. This means that payload capacity is greater.

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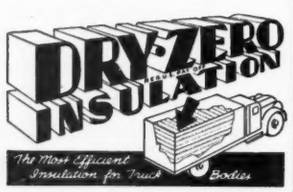

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Information Budget

(*Continued from page 324*)

duction manager would be only too glad to know it. He should not be left to ponder over what he believes to be a foolish move. If the excessive expenditure was merely to be hidden away among the assets, it would only increase the investment in equipment with no offsetting good, and would, of course, be to the detriment of the business. No money should be invested in equipment above the lowest amount which gives maximum efficiency. The use of equipment accounts to cover losses is deadly in the end.

Considering the ordinary duties of the executives involved in our question it looks as if the chief had used poor judgment either in not informing the production manager of his reasons, based on indisputable facts, for allowing the expenditure; or, if inadvisable, in not having the sales problem readjusted on a more safe and profitable basis.

Rentschlerizing

(*Continued from page 327*)

frigerators, lamps may be installed either on the bunkers, below the coils or on the beams supporting them. Where meat rails are used the lamps should be placed midway between and parallel to them. The lamps should be located so that no meat need be hung within 24 in. of them.

In extremely dry climates, artificial humidifiers may be required to increase the natural humidity of the air to 90 per cent so as to prevent loss of weight and of natural juices of the meat.

Much the same reasoning applies to refrigerated display cases, where the air is circulated and one 30-in. Sterilamp is used for six linear feet of display. The temperature is raised to 45 deg., and the humidity correspondingly.

In the bakery, one 30-in. Sterilamp, mounted on the ceiling, for every 40 sq.ft. of floor area is sufficient to maintain sterility in small dough rooms. In larger dough rooms, one lamp for every 50, or even 100, sq.ft., will kill all mold and bacteria, thus

eliminating the greatest source of contamination in the bakery.

To eliminate mold trouble, bakers also find it necessary to protect their products from the time they leave the oven until they are wrapped. In those plants where there are no conveyors, the cooling, slicing and wrapping machines are radiated by installing lamps on the ceiling, just as in the case of the dough rooms. Where conveyors are used, it is usually more economical to install the lamps in a hood over the conveyors. Two Sterilamps should be installed over each 4 ft. length of the conveyor in a metal hood spanning the conveyor, with about 1 ft. clearance between the belt and the lamps.

A cooler of the slow-moving conveyor type requires different treatment. The construction is such that radiation of the baked product is impractical, and intense radiation of the air forced into the cooler is the only method which can be considered. Sterilamps may be placed in the air ducts leading to the cooler, or preferably in a room or radiation chamber where the speed of the air can be reduced to provide more time for effective radiation. The arrangement of the Sterilamps is similar, whether placed in a chamber or in the air duct. In each case, several groups of Sterilamps are installed, the number required being one 30-in. lamp for about 150 cu.ft. of air per minute. Where the air contamination is low, the volume of air per minute per lamp may be increased.

The cost of Rentschlerizing is not great. The operating cost is almost negligible, since four 30-in. lamps can be operated on the power required by a 75-watt Mazda lamp. Maintenance costs likewise are low, as the lamps have an effective life of about six months. Nor is the original cost very high. The 30-in. lamps retail at $10 each, list price, and the price is reduced appreciably where lamps and accessories costing more than $100 are purchased. Accessories needed include a power unit, which lists at $30, one power unit supplying four 30-in. lamps. Fixtures for mounting the 30-in. lamp on walls, ceiling or in display cases are listed at $10 each.

The total cost for a 7x9 ft. walk-in refrigerator (Fig. 3), including the installation, will be between $100 and $125. Where a humidifier is needed to maintain the relative humidity at 90 per cent, an additional cost is involved. The annual operating and maintenance cost for an installation of this size, including Sterilamp replacements, power and interest on investment, is approximately $80.

Contrasting with this cost, a gross saving of $389 per year is possible with such an installation. This saving is arrived at by a conservatively estimated overall reduction in dehydration and trimming losses of 5 per cent on 1,000 lb. of meat per week at 15 cents per pound. This does not include the savings in electric power cost obtained by the increased temperature in the refrigerator.

The installation can be made by any competent electrician or electrical contractor. All units, including the wiring, are standard.

Sterilamp Installation Data

	One 30 in. lamp per	Temperature (deg. F.)	Relative humidity (per cent)
Retail meat store			
Walk-in cooler			
small	30 sq. ft.	40–45	80–90
large	40 sq. ft.	40–45	80–90
Display case	6 ft. lgth.	45	80–90
Bakery			
Dough room			
small	30 sq. ft.	90	95
medium	50 sq. ft.	90	95
large	100 sq. ft.	90	95
Cooling room	30 sq. ft.	55–70	40–60
Wrapping room	30 sq. ft.	55–70	40–60
Conveyors	2 ft. lgth.	55–70	40–60
Air ducts	150 cu. ft. per min.	55–70	40–60

BOOKS RECEIVED

THE STRUCTURE AND COMPOSITION OF FOODS—VOL. III. By Andrew L. and Kate Barber Winton. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N.Y., 1937. 524 pages; 6¼x9¼ in.; cloth. Price $8.

This volume is in three parts. Part I presents physical and chemical data on milk and milk products, covering 209 pages. Part II, which takes up 51 pages, covers eggs, and Part III, the remainder of the volume, is devoted to animal products, meat, meat products, poultry, fish and fish products. Parts II and III contain, in addition to tables showing proximate analyses, ash analyses and percentages of minor mineral constituents, detailed descriptions of the proteins, carbohydrates, fats, meat bases, phosphorus-organic compounds involved in muscular effort and other constituents. The volume contains information from many sources and is studded with references to the literature of food.

THE ROBINSON-PATMAN ACT. By Wright Patman. Published by The Ronald Press Co., 15 E. 26th St., New York, N. Y., 1938. 408 pages; 6x8¾ in.; cloth. Price $4.50.

Many trade practices erroneously thought to be prohibited are entirely permissible under the Robinson-Patman Act. So says Wright Patman, who in this book attempts to clear up the misunderstanding about the measure. He deals with questions arising under the act from the standpoint of the man in business, answering some 400 specific questions as to what is and what is not permitted under the law. The questions cover situations and trade practices arising out of all sorts of distributing arrangements, some going into complex points involving close interpretation of the law. Mr. Patman also gives his opinions on how the business man can operate to his advantage under the law.

Undoubtedly, Mr. Patman knows as much about the meaning which the legislators put into this law as anyone. But it is never possible fully to interpret the meaning of a law by studying the statute books. The real meaning comes out only in court, so Mr. Patman's interpretations of his own law will have to be considered with that in mind.

THE TECHNIQUE OF MARKETING RESEARCH. Prepared by the Committee on Marketing Research Technique of American Marketing Society. Published by McGraw-Hill Book Co., Inc., 330 West 42d St., New York, N.Y., 1937. 432 pages, 6½x9¼ in.; cloth. Price $4.

Food manufacturers who plan to launch new products will profit if they have thorough knowledge of the market for the product and the problems to be solved in putting the new item into profitable distribution. Money will be saved by determining these factors by market research before introducing an item rather than by learning them the easy but expensive way—through sad experience. And proper study beforehand will often prevent a product from being brought out and subsequently "laying an egg."

Many companies are now contemplating the launching of frozen food items, and the risk here is even greater than with an ordinary item because the problems of distribution are far from being solved. So this book will be helpful, treating as it does of marketing research in a practical way. It discusses analysis of the problem, planning of procedure, psychological aspect of questionnaire development, collection of data, organization of personnel, field work, organization of data, tabulation, development of con-

clusions, presentation of results, predetermining the size of a sample and so forth.

The magnitude of information needed before venturing forth with a new product is exemplified by the industrial marketing check chart in this book, which shows approximately 3,600 features that may require study in connection with marketing industrial products.

COMMODITY PACKAGING DATA. Published by United States Tariff Commission, Washington, D.C., 1937. 10½x8 in.; paper.

This contains 36 pages of tables on packages for agricultural and fishery commodities, manufactures thereof and beverages. The table lists the outer and inner containers and gives volume and weight of the former and the weight of the goods packed for shipment.

CHECK SHEET—INTRODUCTION OF NEW INDUSTRIAL PRODUCTS. Market Research series No. 6. Published by Bureau of Foreign and Domestic Commerce, Washington, 1937. 53 pages; 8x10¼ in.; paper. Price 10 cents.

A practical guide to the market research needed before introducing a new product. It contains check sheets of the studies that should be made prior to capital investment in the production and marketing of a new industrial product.

THE STORY OF VITAMIN B_1. Compiled by Dr. C. R. Addinall. Published by Merck & Co., Rahway, N.J., 1937. 52 pages; 8½x11 in.; paper. Free. Isolation and synthesis, properties and standards, assay and units, physiology, presence in the diet and so forth are discussed.

PATENTS

Fruits in One-Half Inch Layers Dehydrated by Application of Heat as High as 320 Deg. F. Under Pressure Reduced From 20 to 29.9 inches of Mercury—James C. Rea and Earl N. Percy, to Dry Fruits Product Co., Oakland, Calif. No. 2,110,821. March 8, 1938.

Margarine Made Non-Spattering by the Addition of Derivatives of the Higher Carbon Chain Carboxylic Acids Group—Frank J. Cahn and Benjamin R. Harris, Chicago, Ill. No. 2,111,042. March 15, 1938.

Fruit and Vegetable Juices Preserved Against Fermentation by Pasteurization and Simultaneously by Exposing to Solar Radiation Without Exclusion of Contained Air—Norton F. W. Hazeldine, deceased, by Lillian Brown Hazeldine, Redlands, Calif. No. 2,111,048. March 15, 1938.

Purified Vitamin A. Prepared From Fish Liver Oil—Harry N. Holmes, Oberlin, Ohio, to Parke, Davis & Co., Detroit, Mich. No. 2,111,049. March 15, 1938.

Cheese Packaged in a Cloth Lined Cylinder of Wood Veneer Having a Stapled Lap Joint—Julius R. Meyers, Sheldon, Wis. No. 2,111,051. March 15, 1938.

Sausages Twisted Into Link Lengths by Mechanical Means—Edward George Hodge, Fall River, Mass. No. 2,111,185. March 15, 1938.

Yeast Dried at a Temperature up to 30 Deg. C. After the Addition of a Pectin and an Extract of Linseed not Exceeding 10 Per Cent of the Dry Yeast Solids—Harold Allden Auden, Banstead, and Philip Eaglesfield, Sutton, England, to Standard Brands Inc., New York, N. Y. No. 2,111,201. March 15, 1938.

Confections Formed, Frozen and Made Ready for Packaging Through the Use of a Common Spacer Which Prevents the Confections From Adhering One to Each Other—Norman M. Thomas, Brooklyn, N. Y., and Edwin W. Kronbach, Cleveland Heights, Ohio, to Warren H. F. Schmieding, Columbus, Ohio. No. 2,111,498. March 15, 1938.

Mayonnaise-Type Salad Dressing Given a Characteristic Quality Through the Addition of a Heated Mixture of an Edible Organic Acid and Pineapple—Simon Gelfand, Los Angeles, Calif. No. 2,111,766. March 22, 1938.

Hearth-Bread Dough Kneaded and Shaped Into Loaf Form by Mechanical Means—John Kosman and Charles S. Brykczynski, New York, N. Y., to George F. Stuhmer & Co., Brooklyn, N. Y. No. 2,111,894. March 22, 1938.

Soft-Curd Milk Made by Mixing Whole Milk Which has Been Subjected to High Pressure Homogenization With More Than an Equal Quantity of Whole Milk Which has Been Subjected to Low Pressure Homogenization—Edward W. Smith, Melrose, Mass., to Submarine Signal Co., Boston, Mass. No. 2,112,203. March 22, 1938.

Vitamin D Made by Activating Provitamin Material by Means of a Gaseous Brush Electrical Discharge—Benjamin Kramer, Samuel Natelson and Albert E. Sobel, Brooklyn, N. Y. No. 2,112,242. March 29, 1938.

Eggs Graded on Weight Basis During Passage Along Runway Actuated by a Weighing Scale—William Chester Wyland, San Gabriel, Calif., to J. W. Wyland & Sons, Los Angeles, Calif. No. 2,112,259. March 29, 1938.

Eggs Graded As to Weight by Means of Tilting Devices Held in Place by Counterweight—Thomas J. Arbron, Royal Oak, Mich. No. 2,112,324. March 29, 1938.

Glutamic Acid Lactam Recovered and Purified by Washing With Ethyl Alcohol and Ethyl Acetate at Low Temperature—Géza Braun, to Standard Brands Inc., New York, N. Y. No. 2,112,329. March 29, 1938.

Fat Content of Milk Determined Volumetrically Without Centrifuging—Georg Mayrhofer, Innsbruck, Austria. No. 2,112,374. March 29, 1938.

Cheese Cake Made by Freezing Portion of the Egg, Sugar and Liquid Ingredients, Thawing, and Adding Remainder of Egg, Sugar and Liquid Constituents—Morris B. Libanoff, Chicago, Ill. No. 2,112,442. March 29, 1938.

Citrus and Other Fruits Heightened in Color Through Treatment with Heated Highly Humidified Air—Bronson C. Skinner, Dunedin, Fla., to Food Machinery Corp., San Jose, Calif. No. 2,112,580. March 29, 1938.

Oil- or Fat-Containing Material Extracted by Solvent on a Continuous Process Basis—Michele Bonotto, Evansville, Ind., to Extractol Process, Ltd., Wilmington, Del. No. 2,112,805. March 29, 1938.

Oleo Oil Stabilized by Addition of Hydrogenated Refined Soya Oil and Lecithin—Harold S. Mitchell to Industrial Patents Corp., Chicago, Ill. No. 2,113,216. April 5, 1938.

Molasses Residue From Cane Sugar Manufacture Fermented by Bacillus tetryl to Produce Butanol and Acetone—Rafael Arroyo, Rio Piedras. P. R. to The Lummus Co., New York, N. Y. Nos. 2,113,471 and 2,113,472. April 5, 1938.

Gluten-Containing Flour Treated With SO_2 or Sulphur Containing Acids, Their Sodium Salts or Organic Addition Compounds to Soften Gluten Without Dispersion For Use in Baking—Hans F. Bauer, to Stein Hall Mfg. Co., Chicago, Ill. No. 2,113,570. April 12, 1938.

Egg Meats Mixed With 5 To 15 Per Cent of Maple Sap Syrup and Frozen—Harry Teichner, Chicago, Ill. No. 2,114,195. April 12, 1938.

Citrus Fruit Cut Into Segments for Freeing From Juice by Mechanical Means—Eli E. Edenfield, Lakeland, Fla. Nos. 2,114,217 and 2,114,218. April 12, 1938.

Sausage Skins Made From Animal Hides—Hans Freudenberg and Oskar Walter Becker, Weinheim, Germany. No. 2,114,220. April 12, 1938.

Dry, Unripe Dates Matured and Softened by Subjection to Hot Humid Atmosphere—Virgil H. Tyler, Ventura County, Calif. No. 2,114,409. April 19, 1938.

Olives Pitted by Mechanical Means—Herbert W. Kagley, to Lindsay Ripe Olive Co., Lindsay, Calif. No. 2,114,425. April 19, 1938.

Emulsion Made From Fatty Material, Water, and a Water-Absorbing Lipin of a Class Consisting of Higher Fatty Acid Esters of Sugars and Sugar Alcohols—Benjamin R. Harris, Chicago, Ill. No. 2,114,490. April 19, 1938.

Starch Made From Corn in Such a Manner that All Process Waters Excepting the Steep Water and Moisture in Discharged Solids are Reused in the Process—Alfred H. Kelling, Oak Park, Ill., to International Patents Development Co., Wilmington, Del. No. 2,114,497. April 19, 1938.

Layers of Freezable Foods Separated From Each Other by Double Sheet of Moisture-Resistant Membrane Preparatory for Freezing as a Solid Block—Thomas Slade Gorton, Jr., Evanston, Ill. No. 2,114,530. April 19, 1938.

Bakery Products Cooled by Radiation of Heat and by Evaporation of Moisture Under Reduced Pressure to a Predetermined Temperature and Moisture Content—Gabe R. Fennema, Baldwin, N. Y. No. 2,114,595. April 19, 1938.

Bread-Making and Flavoring Ferment Prepared by Growing in one Culture a Bread-Making Yeast and Selected and Cultured *Bacillus subtilis*—Leland J. Wilhartz, Chicago, and Mary Minton Brooke, Oak Park, Ill. to Puritan Mills, Inc., Chicago, Ill. No. 2,114,694. April 19, 1938.

Pretzels Twisted by Mechanical Means—William M. Young and Lemon Blair Paules, Harrisburg, Pa. No. 2,114,951. April 19, 1938.

Beers and Ales Packaged Under Vacuum—Duncan R. MacKenzie, Scarsdale, N. Y. to Wallerstein Co., Inc., New York, N. Y. No. 2,114,964. April 19, 1938.

Sugar of Normal Uniformly Sized Crystals Made by Using Molasses Magma to Start Crystal Formation in Hot Super-Saturated Sugar Solutions—Eliseo Luque, Ponce, P. R. to Luque Sugar Process, Inc., Santurce, P. R. No. 2,115,029. April 26, 1938.

Light-Resistant Flavoring Material for Salad Dressings Prepared by Extracting Highly Colored Spice With an Edible Oil so as to Destroy the Easily Light-Sensitive Constituents Without Effecting the Light-Resistant Ones—Dean C. Ingraham, Contra Costa County, Calif. to The Glidden Co., Cleveland, Ohio. No. 2,115,073. April 26, 1938.

Cake Layers Formed by Mechanical Means—Charles Gottfried and Jack MacManus, New York, N. Y. No. 2,115,102. April 26, 1938.

Starch With Quick Malting Properties Suitable for Brewing Made by Dry Roasting to at Least 15 Per Cent Solubility and Mixing With Liquid Starch Conversion Syrup—August J. Bulfer, Argo, and Anthony C. Horesi, Downers Grove, Ill. to International Patents Development Co., Wilmington, Del. No. 2,115,157. April 26, 1938.

Starch Manufactured From Corn by Methods in Which Recovered Process Waters are Reused at Points Nearer Steeping End of System in Proportion to Soluble Contents of Respective Recovered Process Waters—Alfred H. Kelling Oak Park, Ill. to International Patents Development Co., Wilmington, Del. Nos. 2,115,170 and 2,115,171. April 26, 1938.